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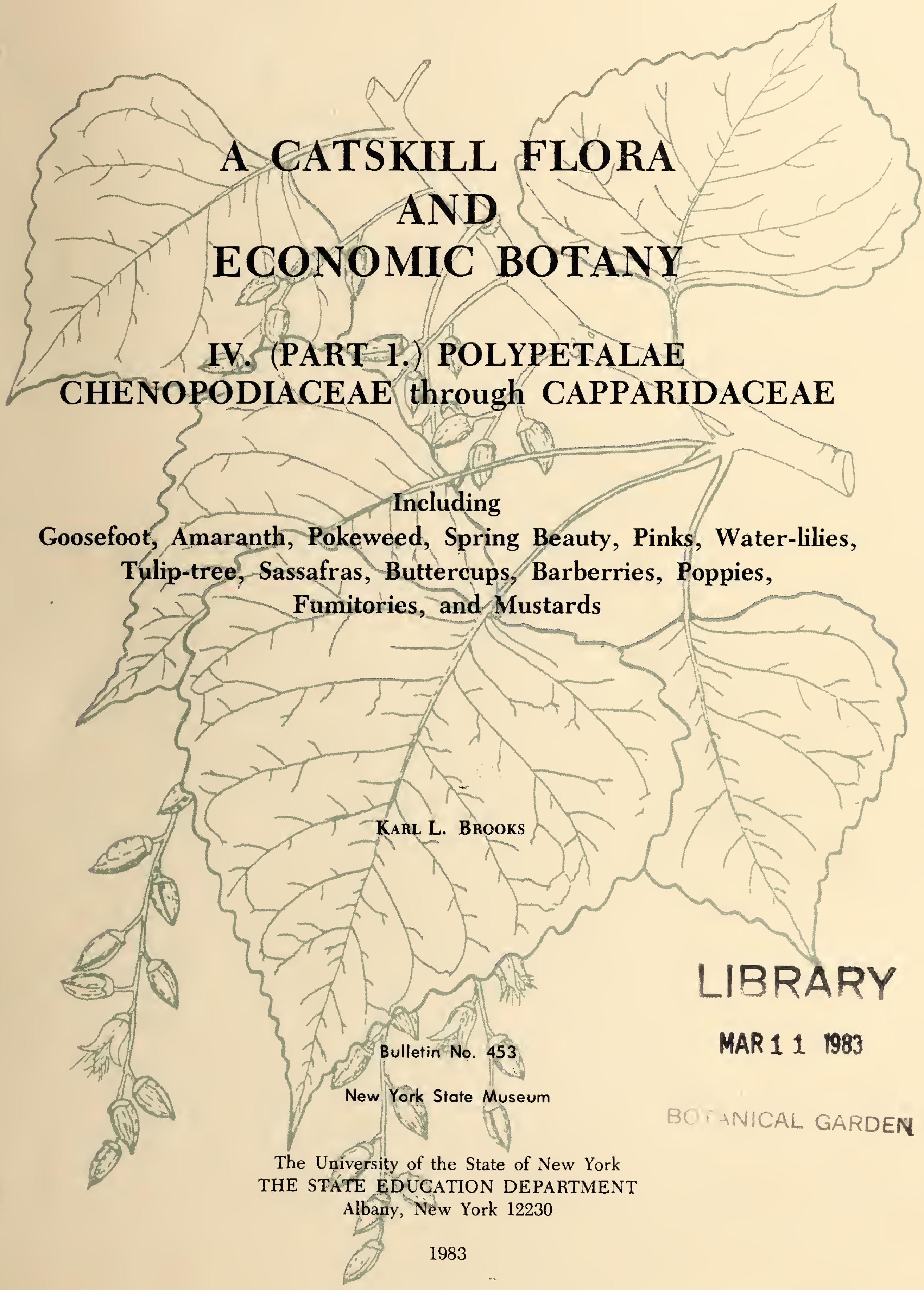

A CATSKILL FLORA AND ECONOMIC BOTANY

IV. (PART I.) POLYPETALAE CHENOPODIACEAE through CAPPARIDACEAE

Including
Goosefoot, Amaranth, Pokeweed, Spring Beauty, Pinks, Water-lilies,
Tulip-tree, Sassafras, Buttercups, Barberries, Poppies,
Fumitories, and Mustards

Karl L. Brooks

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Bulletin No. 453

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The University of the State of New York
THE STATE EDUCATION DEPARTMENT
Albany, New York 12230

1983

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My studies of the Catskill flora

are dedicated

to my good wife

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EDITOR'S PREFACE

This is the work of an amateur botanist whose many years of collection and study of Catskill plants make him the person most qualified to produce such a treatment in the tradition of the old herbals. We at the Botany Office of the New York State Museum feel that this type of publication is a useful adjunct to our efforts to produce a comprehensive state flora. The author's intimate knowledge of the area and its plants makes this a valuable work for those who are native to the Catskills, as well as for the many summer visitors. Medical and food uses of plants, though often only of historical interest, round out the treatment and make this publication what it is intended to be--a source book for those interested in reading and learning about the Catskill flora. Indeed, since the vast majority of the plants discussed are widely distributed throughout the northeastern states and adjacent Canada, this work should also be of interest far beyond the narrow confines of the Catskill region.

IMPORTANT NOTE

All economic uses, folklore, medical and pharmaceutical notes, uses as foodstuffs, etc., are compiled from the literature and do not represent an endorsement by the author or the New York State Museum. Some of the uses may, indeed, be dangerous if incorrectly employed. Some are not effective and are presented for historical interest only.

PREFACE

The Catskills have long been known for their unusual beauty, healthful climate, and their natural resources for recreation, not the least of which is their abundant wildlife and in some respects a unique flora. While it is true that a large percentage of the plants growing naturally in the Catskills also occur throughout most of the northeastern states and adjacent Canada, many species are rare, only locally abundant, or do not occur elsewhere in the eastern states. Some are northern elements found only on the high peaks, and others appear to have been stranded in isolated areas following the retreat of the last glacier some 10,000 years ago. But whether rare in distribution or more abundantly widespread, no plant is completely devoid of interest, and many have had a long and varied association with man that goes back over many millennia.

A study of the flora of any region can be a richly rewarding experience, and that of the Catskills is no exception. Simply getting to know what plants grow in a particular area brings one closer to an understanding of the wonders of nature, but it has long been my contention that just knowing a plant by name is only the beginning. What is its relationship to other plants, both wild and cultivated? Of what value is it to man and to wildlife? Is it edible, a source of dye, useful as a medicine, or is it just an obnoxious weed? How can it be prepared for the table? For what was it prescribed? How can one get rid of it? Answers to such questions not only lead us down many intriguing paths, but also contribute much to our understanding of the intricacies of the biosphere.

My work on the Catskill flora during the last three decades has therefore had a three-fold objective: (1) to determine precisely what species grow in this area, (2) to chart the known distribution of each species in the Catskills, and, (3) for each, to collect as much information as possible concerning its value to man and to wildlife. These objectives have led to many hours of work in the field collecting specimens and making observations of the plants seen, plus countless others in libraries and herbaria to obtain information on their distribution and use.

This work was written primarily for the serious amateur with a desire to know more about the plants growing in the northeastern states and adjacent Canada, with particular emphasis upon those occurring in the Catskills. In these times of increasing concern for man's impact upon the environment, the dwindling food supply in relation to increased population pressure throughout the world, inflation, and the rising desire of a large segment of the people to return to fundamentals, as it were, it is hoped that the emphasis given to economic botany, and to the importance of our native flora to wildlife, will fill a basic need. So far as the writer is aware, this is the first time that detailed information on food, drug, and dye plants has been assembled in a compilation that includes the common weeds as well as the more obscure components of our flora such as the grasses and sedges, which most popular field guides ignore completely.

In addition, "plant biographies" summarizing basic data concerning the name, type of plant, range, distribution, origin, and time of flowering (or fruiting) are provided for each plant occurring in the Catskills, together with some remarks on other salient facts of the plants in question. Detailed distribution maps show by township the localities where each species has been collected or observed; this information is supported by data culled from the literature and an examination of herbarium specimens, in addition to many thousands of observations in the field. The use of observations is a comparatively recent innovation in helping to determine the distribution of the many species making up our flora. These data, together with the keys, illustrations, and detailed notes on each of the various species, should help the serious student not only to identify the plants in question, but to provide the basic knowledge that will enable him to view the plant world as a vital part of the planet on which he lives.

One point may perhaps require some explanation. In the "plant biographies," the time of flowering, as given in the current manuals for the flora of the northeastern states, covers the whole geographic range for the species under discussion. This range in some instances may extend from northern Quebec to Florida and Texas, resulting in a blooming period from April in the southern part of its range to July or August at the northern limits of its growth. Wherever possible the writer has therefore included the time of flowering at Cornell as reported in Wiegand and Eames (1925). Cornell is of course not located in the Catskill region, but it is located in the same general latitude. It is consequently hoped that this information from Cornell may give the reader a closer approximation of the dates when he may expect to find these plants blooming in the Catskills.

In collecting and organizing this information, the writer has attempted to proceed from the general to the more specific, starting with the orders into which the various plant families are organized, then presenting some ideas on their evolution and possible relationships to each other, together with comments on both wild and cultivated plants, in the hope that such an overview will provide a more meaningful picture of each group of plants. The families making up each order of the Catskill flora are then presented (in "manual" order), with an attempt to relate any cultivated plants in that family to their wild cousins before going on to a discussion of the wild species themselves. Where possible, information on their economic value to man and to wildlife has been supplied. With few exceptions, genera are arranged alphabetically under families, and species are arranged alphabetically under genera. To aid in the identification of the various species, keys to genera and species are included, and illustrations of the various species have been chosen with considerable care.

Some may object that such an accumulation of material is not truly a flora, but that is a matter of definition. In any case, such a study is not only its own reward, but a knowledge of the world of plants and their relationships to wildlife and to man, not to mention an enjoyment of the natural world as opposed to the artificial concrete jungles of our modern cities, brings a perspective not to be attained in any other way. This may perhaps seem to be getting far afield, but all the world is an intricately balanced biosphere, and man must not only understand its complexities but must also be able to accommodate himself to its demands if he, himself, is to survive as a species.

A work of this nature could not have been completed without the help and encouragement of a number of people. My wife, Marguerite, has borne the brunt of my numerous idiosyncrasies, both as a constant companion in the field and as a demanding editor and critic. The late Stanley J. Smith, Curator of Botany at the New York State Museum, not only spent countless hours checking my specimens and graciously permitted access to the state's records on plant distribution, but has also been mentor and companion in the field on many occasions, to say nothing of his continuing advice and encouragement for over a quarter of a century. In addition to supplying moral support and companionship in the field, Paul Huth, who fell heir to the Domville-Dunbar records of the Ulster County flora, was kind enough to check through several thousand cards to extract information pertaining to collections and observations made in the Catskill region of that county. In addition, mention must be made of the work of Robert Dirig and Spider Barbour, who have contributed a number of important records.

More than thanks are due to Elizabeth G. Hall, formerly librarian at The New York Botanical Garden, whose vast knowledge of botanical source material seems inexhaustible and whose boundless enthusiasm is infectious. She has been unfailing in digging out elusive books and suggesting sources of information in addition to supplying many details concerning earlier workers in the field. Special thanks are due to Richard S. Mitchell, State Botanist, for his editorial services and his painstaking work in guiding this series of bulletins through the press, to say nothing of his continued interest and encouragement. Charles J. Sheviak, Curator of Botany at the New York State Museum, has earned the writer's gratitude by making the services of his office readily available. The writer is likewise indebted to J. Kenneth Dean, a staff member of the Botany Office at the New York State Museum, for numerous courtesies, including checking out a number of critical species. Librarians at both the Horticultural Society of New York and at The New York Botanical Garden have also been most helpful. Last, but in no way least, thanks are due to Patricia Holmgren, herbarium supervisor and administrator of the phanerogamic herbarium at The New York Botanical Garden, and to George Kalmbacher, curator at the Brooklyn Botanic Garden, for permission to check specimens in the herbaria at those institutions.

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Karl L. Brooks

Brooklyn, New York
20 March 1982

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POLYPÉTALAE OF THE CATSKILLS

The Polypetalae constitute the second of the three large groups of plants into which the dicotyledons have traditionally been segregated. The first group, the Apetalae, is discussed in the preceding volume. The Polypetalae are characterized by having floral parts typically spirally arranged and usually consisting of a calyx, a corolla of five to many petals, numerous stamens, and often a compound pistil with separate carpels. For the amateur, the chief distinction marking this group is probably the five to many separate petals making up the corolla, although in some genera the perianth is often not differentiated into calyx and corolla. The large number of stamens is another feature that helps to distinguish this group of plants from the Sympetalae, the next large group of dicots, in which the corolla is usually fused to form a tube (at least at the base), instead of having the petals separate. Care must be taken, however, not to confuse the ray flowers of the Compositae with the separate petals of this group of plants. At first glance one might, for example, think that the common Oxeye Daisy belonged in the Polypetalae, but careful examination of the ray flowers will disclose the fact that each ray is an individual flower.

The Polypetalae of the Catskills are here grouped under five orders: Caryophyllales, comprising the pinks and related plants; Ranales, comprising the buttercups and related plants; Rhoedales, comprising the poppies, mustards, and related plants; Sarraceniales, comprising the pitcher-plants and sundews; and Rosales, comprising the roses, legumes, and related plants.

CARYOPHYLLÀLES

This order, also known as the Centrospermae, contains 10 families, only 6 of which occur in the Catskills. The several families exhibit a graduated series of stages in the reduction of the flower, essentially in reverse of the usual "manual sequence" in which they are presented here. In part of the Caryophyllaceae the sepals and petals are well developed, there are two circles of stamens, and the fruit is a many-seeded capsule. From this family to the Chenopodiaceae there is a strong tendency toward smaller flowers, reduction and loss of corolla, and reduction in the number of stamens. Bessey designated this order the Caryophyllales, which he thought had been derived from ranalian ancestors. Hutchinson, on the other hand, divided these families into two orders, the primitive Caryophyllales (derived from ranalian stocks) and the Chenopodiales, which he considered much advanced over and derived from the Caryophyllales. Cronquist (1968) takes a somewhat broader point of view; his subclass Caryophyllidae includes 4 orders and no less than 14 families, of which 11 are included in the Caryophyllales (derived from the Magnoliales), which he considers the most primitive order of the subclass. Among these 11 taxa, he includes Molluginaceae as a family distinct from the Aizoaceae, in which it has previously been submerged. From the traditional point of view, perhaps, his placement of the Cactaceae and the Didiereaceae in the Caryophyllales may come as something of a jolt, as both taxa have formerly been considered as elements of the Sympetalae.

Key to Families of the Catskill Caryophyllales

1. Ovary 3-15-celled (petals none, but with a petaloid calyx), 2
   2. Coarse perennial herbs 1-3 m high; leaves alternate; berries borne on peduncled racemes 1-2 dm long.......... Phytolaccaceae
   2. Prostrate annual herbs with repeatedly forked stems forming mats; leaves clustered in whorls at the joints; capsules borne on 1-flowered pedicels that form a sort of sessile umbel.. Aizoaceae
1. Ovary 1-celled, 3
   3. Ovary commonly with several ovules; petals usually present; fruit a capsule, 4
      4. Sepals 2; stamens 7-20; plants succulent or fleshy... Portulaceae
      4. Sepals 4 or 5; stamens 4-10; plants of dryish texture, rarely succulent................................ Caryophyllaceae
   3. Ovary with a single ovule; petals none (fruit indehiscent or circumscissile; leaves exstipulate, chiefly opposite), 5
      5. Calyx herbaceous; flowers without scarious bracts. Chenopodiaceae
      5. Calyx dry and scarious; flowers subtended by scarious bracts... Amaranthaceae

CHENOPODIÀCEAE, the Goosefoot Family

This is a family of about 102 genera and 1400 species, distributed throughout the temperate and tropical zones but especially well represented in arid zones, where some species are valuable forage; others are plants of saline soils. Very few are ornamental; many are weeds. The family is represented in the United States by about 22 genera, of which 12 are found in the northeastern states and adjacent Canada; only 3 of these occur in the Catskills. The largest genus in this family is Chenopodium, with about 100 species.

Economically the family is of minor importance, with the Garden Beet (Beta vulgaris) providing a commercial source of sugar as well as a root vegetable, followed in importance by the potherbs Spinach (Spinacea oleracea) and Swiss Chard (Beta vulgaris var. cicla). These commonly cultivated species occasionally persist in gardens or appear as waifs on rubbish piles, but they have not become naturalized in the Catskills. Oil of wormwood, a vermifuge, is obtained from seeds of Chenopodium anthelminticum, and a few members, notably Cypress Spurge (Kochia), are grown as ornamentals. Several species of Salsola and one species of Salicornia have in the past been used as sources of washing soda (sodium carbonate), used in household and laundry work.

Key to Catskill Genera of Chenopodiaceae

1. Flowers unisexual, the pistillate ones mostly without a calyx; plants monoecious or dioecious; fruit enclosed and concealed between 2 triangular bracts (leaves lanceolate or hastate-ovate) .... Atriplex

1. Flowers perfect, not enclosed between special bracts, 2
    2. Sepals each with a dorsal winglike projection; leaves linear-lanceolate, 3-7 mm wide (plant diffusely branched, green in autumn).. Kochia
    2. Sepals naked (herbaceous, greenish); leaves lanceolate to ovate (plants glabrous, white-mealy; flowers few to several in glomerules, forming a terminal panicle).................... Chenopodium

Átriplex L. Orach.

There are about 150 species of Atriplex, widely distributed in both hemispheres, most abundant in alkaline or saline soils and dry climates. Several species are important forage plants in the western states. The generic name was the ancient Latin name of A. hortensis, Garden Orach. The seven or eight species occurring in the northeastern states are annual herbs, usually mealy or scurfy with branlike scales and with spicate-clustered flowers in summer and autumn. Sea Orach, A. halimus, according to Sturtevant (1919), is one of the few indigenous plants of Egypt that affords sustenance to man. It was also mentioned by Dioscorides as a cooked vegetable. The Asiatic Mountain Spinach or Garden Orach, A. hortensis, is another species that has long been used as a potherb in Europe, for it was known both to the ancient Greeks and Romans. It is still grown in some parts of Europe as a substitute for Spinach and to correct the acidity and the green color of sorrel. It has also been cultivated in the United States, for it was mentioned as a garden vegetable as early as 1806. The foliage is normally green, but there are crimson-leaved varieties cultivated as ornamentals. The seeds, according to Millspaugh (1892), have been used as an emetic, as also have those of A. angustifolia. A. hortensis var. rubra, a plant with reddish or purplish-red leaves that grows 3 to 4 feet high, is of value to the gardener, for both the foliage and flower spikes provide attractive material for cutting.

Átriplex pátula L. Orach.

Meaning of Species Name. Spreading.

Other Names. Spearscale, Lamb's-quarters, Fat-hen, Saltbush, Seaside Orache, Arrach, Spreading Orache, Vulvaria, Dog's Arrach, Goat's Arrah, Wild Arrach, Stinking Arrach, Stinking Motherwort.

Type of Plant. An annual herb, reproducing by seeds.

Habitat. Saline, brackish, or rich soils, both coastal and inland; salt meadows, marshes, and waste places.

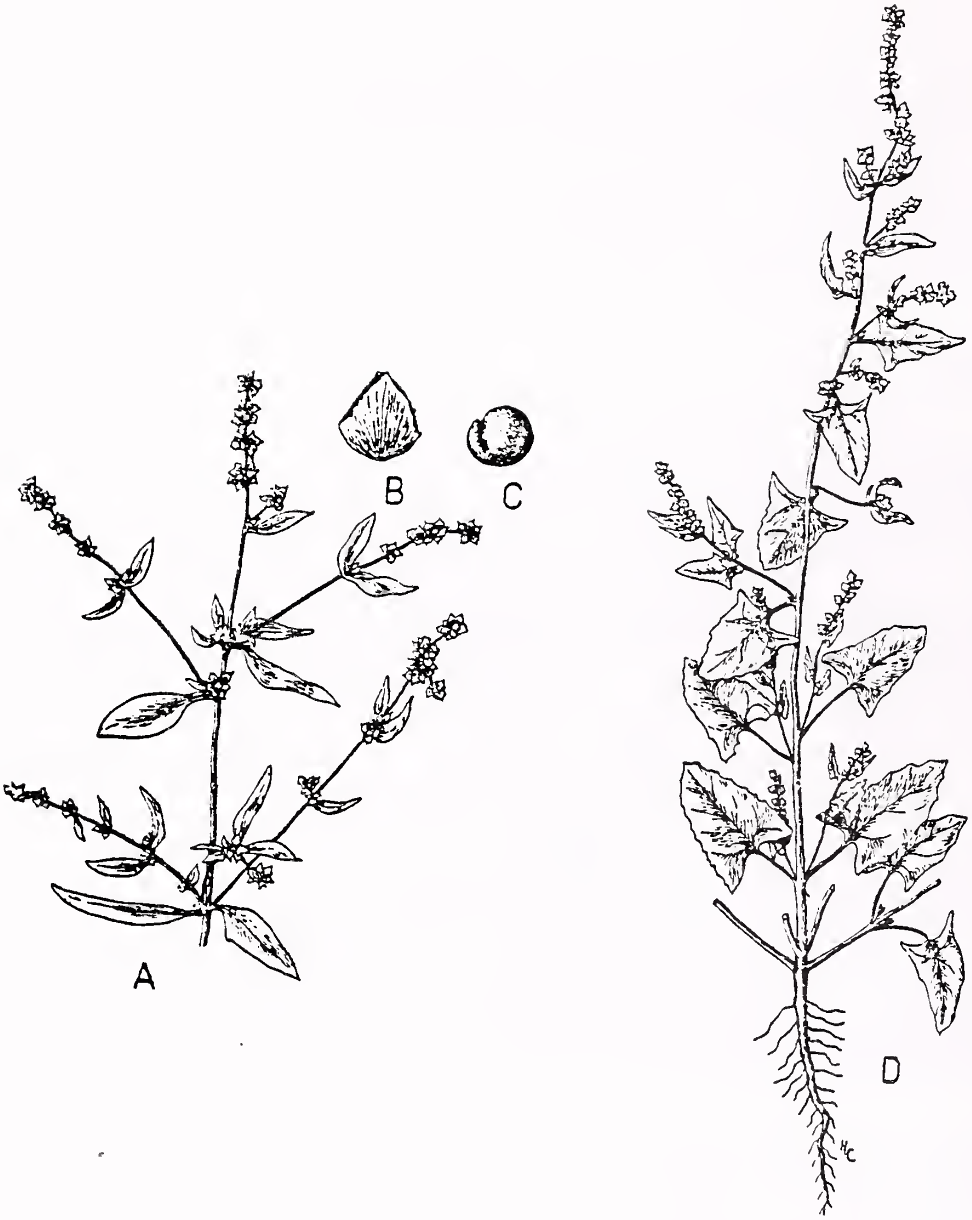
Range. Nf to BC, s to SC, O, Ind, Ill, Mo, and westw.

Distr in NYS. Chiefly near the Atlantic coast of LI and SI and along adjacent shores; inland at Albany, Onondaga L, and other localities.

Distr in the Torrey Range. Common. Var. patula: common locally as a weed; var. hastata: common throughout the range but more frequent along the coast and up the river valleys than elsewhere.

Time of Fl. (Jul)Aug-Oct(Nov); Aug-Oct at Cornell.

Origin. Both native and adv from Eurasia.



(Left) Atriplex patula var. hastata; (right) A. patula var. patula--Orach
[From Muenscher (1952), Fig. 25, p. 203.]

As a potherb, this species is considered by many to be superior to Lamb's-quarters or Pigweed (discussed below). The succulent leaves and young growing tips, especially when the plant grows along the seashore, are juicer and somewhat impregnated with salt. The plant is often so abundant on seashores that it might supply many families throughout the season.

Culpepper was emphatic in his commendation of this species for every kind of women's diseases, and it was once used in the treatment of hysteria. Several species have starchy seeds that have been used by the

Indians. In the western states *A. patula* var. *hastata* is one of the species causing hay fever during the summer months, particularly in parts of California. In areas where this species has become an undesirable weed, the young seedlings are easily destroyed. Clean cultivation early in the season, followed by hand pulling of scattered plants to prevent seed formation, will bring this species under control. The two varieties of this plant are distinguished as follows:

1. Principal leaves triangular or arrowhead-shaped with spreading lobes, often toothed; fruiting bracts truncate (cut straight across) or broadly rounded at base.............. *A. patula* var. *hastata*
1. Principal leaves oblong or lanceolate, mostly without teeth or with a few low teeth; fruiting bracts slightly narrowed or narrowly rounded at base............................ *A. patula* var. *patula*

Chenopodium L. Goosefoot.

There are about 100 species of *Chenopodium*, a nearly cosmopolitan genus, many of which are weeds of wide distribution. The name of the genus is derived from the Greek *chen*, goose, and *pous*, foot, in allusion to the shape of the leaf in some species. Mature seeds are necessary for proper identification. Most of our species are annual weeds, usually with a white mealiness on the foliage. The mostly sessile flowers grow in small clusters forming panicles or spikes; they bloom through late summer and autumn. There are some 24 species in the northeastern states and adjacent Canada, only 7 of which occur in the Catskills.

Several species of *Chenopodium* have long been used either as food plants or for their medicinal virtues. *C. bonus-henricus*, Good-King-Henry, was formerly much cultivated in England as a potherb, still esteemed at the beginning of the present century in Lincolnshire and some of the Midland counties of England. In addition to its use as a boiled green, the young shoots were often peeled and prepared as a substitute for Asparagus. *C. auricomum*, a native of Australia, has also been cultivated in England as a substitute for Spinach, while *C. quinoa*, a native of the Pacific slopes of the Andes, is still cultivated in that region as greens and for its seeds, which are added to soups, boiled like Rice and eaten with milk, and prepared in various other ways. Among the native North American species is the California Goosefoot or Soap Plant, *C. californicum*, found in the foothills of the Sierra Nevada and coast ranges, the grated roots of which were once used as soap by the Indians. Indians of the southwest steeped an undisclosed species of *Chenopodium* in hot water and inhaled the steam as a headache remedy.

One of the most noted species of this genus, however, is *C. ambrosioides*, Mexican Tea or Wormseed, a native of tropical America believed to have been used by the Mayas as a vermifuge. In time Indians farther north became acquainted with the medicinal virtues of this plant, for the Creeks employed it as a spring tonic and febrifuge, while the Natches used it both to allay fever and to expel worms in children. The Catawbas beat the whole plant to a mash for use as a poultice on sores and snakebites. In New Mexico it was also used as a tea to hasten milk flow from nursing mothers and to relieve post-delivery pains. It is said to be popular in Mexico and parts of South America, where it is reported to be raised for tea. Medicinal use of this plant even spread to Europe, where, in addition to being prescribed as a vermifuge, it was employed in the treatment of malaria, pectoral complaints, asthma, and as a remedy in nervous afflictions.

Wormseed was long considered a most efficient anthelmintic, particularly effective in expelling roundworms in children, but it was also used in treating hookworms and other intestinal parasites, both in humans and in veterinary practice. All parts of the plant were occasionally used but only the fruit was official, from which a volatile oil was extracted. During the 1800's it was cultivated to a considerable extent in Maryland, and Baltimore became the commercial center for the distillation of the crushed fruits. Oil of chenopodium was official in the U.S. Pharmacopeia, 1820-1947, and in the National Formulary, 1947-60. It was found to be an unsafe drug; overdoses are toxic and have caused death both in human beings and animals. It has now been displaced by other chemical products, although it is still currently in demand by manufacturers of drug products. Under ordinary conditions Mexican Tea is not eaten by animals, but one authority states that livestock have been poisoned by it when forage was in short supply.

Goosefoot seeds are relished by wildlife in many parts of the country. The persistence of some seeds on plants late in the year makes these weeds particularly valuable to many kinds of songbirds as well as to upland gamebirds, small mammals, and even to white-tailed deer. Nearly 75,000 seeds have been counted on a single plant of Lamb's-quarters.

Kingsbury (1964) reports that several species of *Chenopodium* have been considered toxic or potentially toxic to farm animals. *C. album* sometimes contains potentially dangerous concentrations of nitrate, poisonous to livestock when eaten in large amounts. Other species, some of which are found in the United States, have been suspected of causing loss of livestock in Australia. In the United States loss of animals due solely to eating these species has not been reported, but it is suspected that the presence of these plants in hay may have contributed to its toxicity.

Key to the Catskill Species of *Chenopodium*

1. Seed orientation vertical or mostly vertical, only the terminal sometimes horizontal (plant glabrous, not mealy; flowers in large spicate glomerules 0.5-1.5 cm thick, all or mostly in leafless spikes; calyx at maturity becoming red, fleshy, berry-like, and more or less confluent in spherical glomerules).................. *C. capitatum*
1. Seed orientation horizontal, 2
   2. Larger leaves rounded or cordate at base, 7-17 cm long and 4-12 cm wide; leaves thin, acuminate and with large long-pointed teeth, green throughout; panicle very loose and open, nearly naked; pericarp easily removed from the lustrous seeds; seeds 2-2.5 mm broad...................... *C. hybridum* var. *gigantospermum*
   2. Larger leaves attenuate to subtruncate at base (if rounded, thick and bluntish or merely acutish), less than 7 cm long and less than 4 cm wide; seeds 0.5-2 mm broad, 3

3. Pericarp free from or easily removed from seed (principal leaves on long petioles; leaves thin, oblong to lanceolate, green and scarcely farinose, the larger ones 3-6 cm long; seeds 1.3 mm broad; plant erect, very slender, up to 1 m high)................ *C. boscianum*
3. Pericarp closely adherent to and with difficulty removed from seed (flowers in thick glomerules forming heavy interrupted spikes or cymes), 4
    4. Principal leaves lanceolate to elliptic, narrowly ovate or oblong, entire or nearly so, green, glabrous or nearly so; glomerules scattered in slender and interrupted spikes; seed 1-1.2 mm broad... *C. lanceolatum*
    4. Principal leaves rhombic to broadly ovate, more or less farinose; glomerules crowded on dense branches; seed 1.3-2 mm broad, 5
        5. Young stem and foliage farinose; leaves glaucous, strongly farinose beneath; fresh calyx lobes scarcely keeled; seed 1.3-1.5 mm broad; surface of seed more or less smooth... *C. album*
        5. Young stem often purple or red; leaves dark green or yellowish, only sparingly farinose; fresh calyx lobes sharply keeled; seed 1-2 mm broad; surface of seed with a honeycombed appearance, 6
            6. Seed 1-1.5 mm broad; calyx lobes prominently keeled along the center, the keel often equaling half the width of the calyx lobe; base of style often prominent; pericarp show- a yellow area around base of style; leaves rather thick; plant ill-scented.............................. *C. missouriense*
            6. Seed 1.5-2 mm broad; calyx lobes only slightly keeled along the center; base of style little if at all prominent; pericarp not showing a yellow area at base of style; leaves rather thin to membranaceous; plant not ill-scented... *C. paganum*

Chenopòdium álbum L. Lamb's-quarters.

Meaning of Species Name. White.

Other Names. Goosefoot, Pigweed, White Goosefoot, Fat-hen, Mealweed, Frost-blite, Baconweed, Wild Spinach, Muckweed, Mutton Tops, Dirtweed, Dirty Dick, Midden Mules, Allgood.

Type of Plant. An annual herb, reproducing by seeds.

Habitat. Cult fields, gardens, roadsides, waste places, dry woods, and barrens.

Range. Throughout the U.S. and s Canada; also in Eurasia and now widely introd in other parts of the world.

Distr in NYS. A common weed almost everywhere except in undisturbed forests.

Distr in the Torrey Range. Common throughout the range.

Time of Fl. Jun-Oct; Jul-Sep at Cornell.

Origin. Natzd from Eu for the most part.

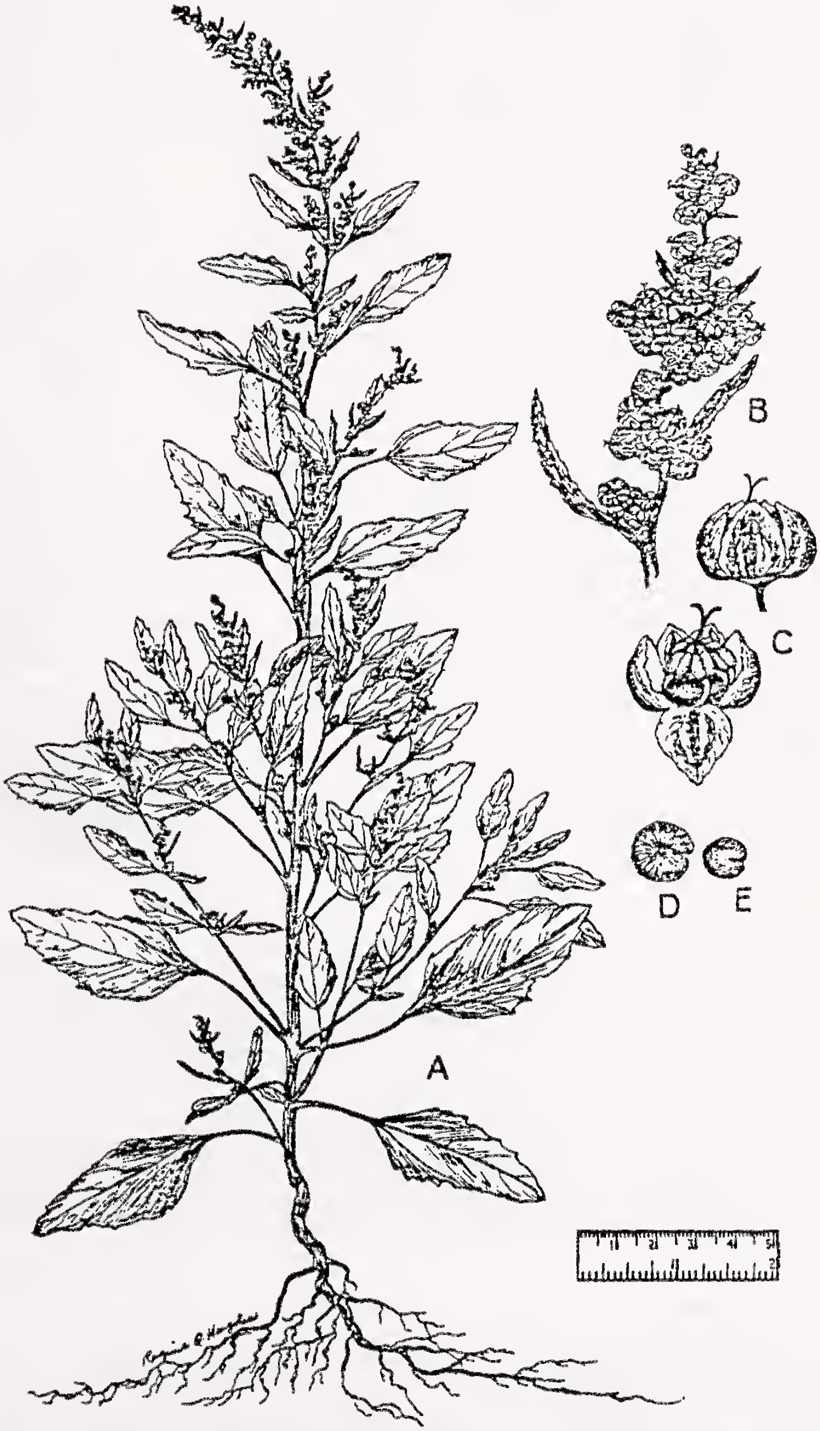
Remarks. Our plants are partly native and partly introd.

Lamb's-quarters, also known as Goosefoot and Pigweed (the latter a name perhaps better reserved for species of Amaranth to avoid confusion), a relative of the Beet and Garden Spinach, is one of the most common weeds that can be used for food in the Catskills, exceeded in availability perhaps only by the Dandelion. It has always been highly prized by Europeans; indeed, remnants of this plant have been found in the Lake Village culture of Switzerland, indicating that this species has been used as food for untold centuries, probably both as a potherb and for its seeds. In view of the fact that the young plants, 6 to 8 or 10 inches tall (available weeks before any garden plant is ready for the table), make a delicious tender "spinach" resembling beet greens in taste but rather more delicate both in texture and flavor when boiled as a potherb, it is difficult to understand American prejudice against this plant. Sweeter to the taste than Spinach, it is one of the finest potherbs available. It can usually be found in disturbed soils or cultivated ground from spring until early fall so an ample supply is nearly always available. In addition, it is not only highly nutritious but also rich in vitamin C. The young plants can be boiled in slightly salted water for 8 to 10 minutes and served with salt, pepper, butter, and, if desired, a few drops of vinegar. They are likewise excellent when served with soy sauce. The crisp young shoots, somewhat resembling cabbage in flavor, can also be combined with other greens in a mixed salad, to which a few wild mustard seeds will impart an added pungence. Even from older plants one can usually collect tender tips for a crisp salad.

In cooking, Lamb's-quarters, like Garden Spinach, reduces considerably in bulk so it is necessary to gather two or three times the amount that is wanted when cooked. Some persons feel that it requires a bit more cooking than does Spinach, but it does not require parboiling as do most other wild greens. These greens can even be blanched for a short time in boiling water, drained, packaged, and frozen for use during the winter. The fresh leaves readily shed water, but they promptly lose this characteristic when cooked. Since it makes a comparatively dry potherb when boiled, some cooks combine it with dock greens (which do not reduce in bulk when cooked) for added flavor, "wetness," and a somewhat mucilaginous character. Bacon fat and crisply fried, crumbled bacon make an excellent garnish. For those who wish to venture beyond the simple "boiled greens" stage, Berglund and Bolsby (1971) offer a number of intriguing recipes, including Lamb's-quarters soup with meatballs, braised Lamb's-quarters, sweet and sour Lamb's-quarters, Lamb's-quarters kaposzta style, and roast goose with Lamb's-quarters.

This species bears a heavy crop of seeds in panicles at the ends of the branches. These seeds have been used for food in many cultures almost throughout human history. In some areas they formed part of the basic diet while in others they have been used only as an emergency food. Since the seeds are unusually abundant (as many as 70,000 have been counted on a single plant) and since the plants hold their seed until well after heavy frosts, they have often had considerable value as a "grain" that could be stored for later use. The seeds are also reported of value in feeding poultry, and one authority stated that this plant has been grown in Canada as food for pigs and sheep.

J. R. Dodge in 1870 reported that the Indians of Arizona, New Mexico, Utah, and California collected the young plants of this species, which they "boiled as herbs alone, or with other food. Large quantities also are eaten in the raw state. The seeds of this plant are gathered



Chenopodium album--Lamb's-quarters
[From USDA Agr. Research Sv. (1971), Fig. 64, p. 133.]

by many tribes, ground into flour after drying, and made into bread or mush. They are very small, of a gray color, and not unpleasant when eaten raw. The peculiar color of the flour imparts to the bread a very dirty look, and when baked in ashes it is not improved in appearance. It resembles buckwheat in color and taste, and is regarded as equally nutritious." Johnston (1970) states that Indians of the northwestern Great Plains used the young shoots of this species to make a green dye, while the seeds were gathered for food. Some tribes also used this or a closely related plant medicinally, making a tea of the leaves to relieve stomach pains.

For those who may wish to experiment with the seeds, when the panicles are dry in late fall it is comparatively easy to gather them in considerable quantity by stripping off the clusters into a pail. The husks can then be rubbed between the palms to separate the seeds, and the chaff can be easily winnowed out on a windy day. These seeds make fine food for caged birds, but they are also useful in other ways. Ground into a flour and mixed half and half with rye or wheat flour (a practice which, in earlier times, helped to extend the supply of regular flour), the dried seeds make excellent pancakes, muffins, and biscuits. The seeds are very hard and slippery, inclined to jump and bounce around while being ground. In experimenting with making flour from these seeds, Fernald and Kinsey (1943) found it advantageous to boil them for a couple of hours, then mash them and dry out the mass before attempting to grind them. Bread made from this flour is dark-colored because of the black seed coats but of good flavor and highly nutritious, but some people are not enthusiastic about the characteristic "mousey" flavor distinctive of the seeds from this group of plants. The small seeds can even be eaten raw or added to bread, muffin, or biscuit dough to impart a pumpernickel-like taste, or they can be cooked with corn meal or other grains to make a gruel or mush to be eaten like porridge. They can also be made into cakes to be baked slowly over a campfire or in a reflector oven made from flat stones.

To most gardeners and farmers this plant is just a common weed. In areas where it has become a nuisance Muenscher (1952) suggests that it can be controlled, particularly in the garden, by hand weeding or hoeing. In cornfields and other cultivated crops, clean cultivation and harrowing while the crop plants are small will bring it under control. Where possible, the young tender plants of this and related species should be plowed under as a green manure to enrich the soil, or they can be fed to hogs and poultry as green fodder. In some areas the abundant pollen produced by this and related species is considered responsible for producing hay fever.

Chenopodium boscianum Moq. Bosc's Goosefoot.

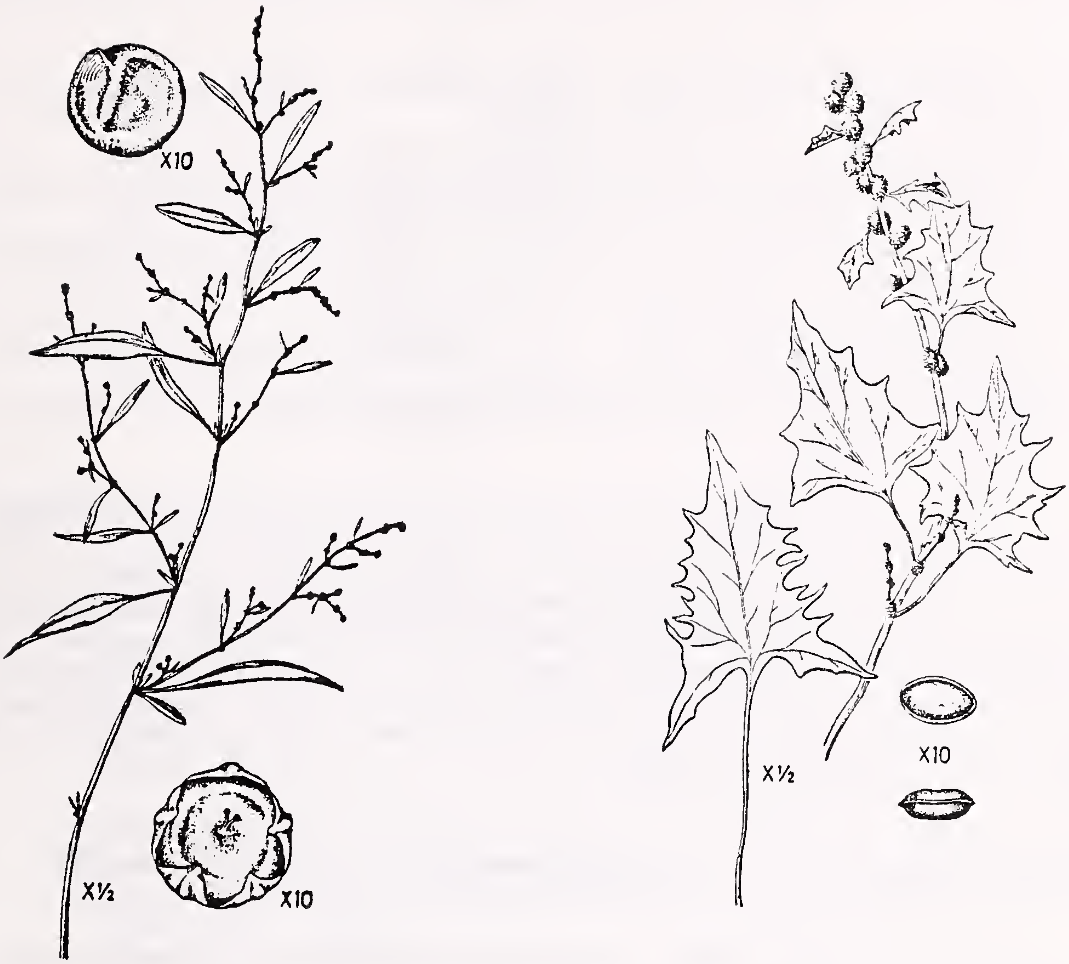
Meaning of Species Name. Named for its discoverer, Louis Augustin Guillaume Bosc, 1759-1828.

Synonyms. C. hybridum L. var. standleyanum (Aellen) Fern. in Fernald (1950); C. standleyanum Aellen in Gleason (1952).

Type of Plant. An annual herb, reproducing by seeds.

Habitat. Dry open woods, thickets, roadsides, and waste places.

Range. Que and NY to Ind, Minn, and SD, s to Va, Ga, Ark, and Tex; also reported from Ct, Fla, and NM.



(Left) Chenopodium boscianum--Bosc's Goosefoot;
(right) C. capitatum--Strawberry-blite
[From Gleason (1952), II: left, p. 90; right, p. 93.]

Distr in NYS. Infrequent in woods and thickets of s NY.

Distr in the Torrey Range. NY: Westchester and Bronx counties and on SI; a rare species whose distribution is little known; apparently more common in the [s] drainage of the Delaware r than elsewhere.

Time of Fl. Jul-Oct.

Origin. Native.

This is an easily recognizable species, for its combination of relatively thin, mostly dull green, often entire leaves, small interrupted slender inflorescences, and rounded calyx-lobes which do not cover the fruit are distinctive. Its mostly delicate, slender habit and its woodland or at least usually shaded habitat are also characteristic of this species.

Chenopòdium capitàtum (L.) Aschers. Strawberry-blite.

Meaning of Species Name. With heads.
Other Names. Indian-paint, Blite Mulberry, Strawberry Spinach, Strawberry Pigweed, Indian Strawberry.
Type of Plant. An annual herb, reproducing by seeds.
Habitat. Light dry soil of woodland clearings, thickets, burns, roadsides, old fields, waste places, and cult ground.
Range. Que to Ak, s to NJ, Pa, Ind, and Mo; widely distr in the Pacific states, also in Eu.
Distr in NYS. Infrequent across the state.
Distr in the Torrey Range. Not common as a roadside weed in our range.
Time of Fl. Late May-Aug; Jul 20-Aug at Cornell.
Origin. Eurasia.

The red, berry-like fruit clusters on the stems of this plant are reported to have been used in Europe as a source of food coloring. There is even a hint that it has been used to dye wool or cotton, for one authority states that "dye plants such as strawberry-blite ... are noxious weeds, so they are grown under very careful control." In Alaska this species is eaten boiled as a source of greens in the spring; the leaves have a spinach-like flavor and may be used as a substitute for it. The succulent fruits, although rather insipid, can be eaten either raw or cooked; they are considered to be highly nutritious.

Chenòpodium hýbridum L. var. gigantospérmum (Aellen) Rouleau. Maple-leaved Goosefoot.

Meaning of Species Name. Hybrid (a misnomer); var. name, large-seeded.
Other Names. Sow-bane, Swine's-bane.
Type of Plant. An upright annual, reproducing by seeds.
Habitat. Moist rocky woods, thickets, clearings, fields, roadsides, and waste places, mostly in rich gravelly soils or shady places.
Range. Que to Yuk, s to Va, Ky, Mo, Ark, Okla, Tex, NM, and Cal; also in Eurasia.
Distr in NYS. Frequent or common in most secs of the state.
Distr in the Torrey Range. More common as a roadside weed than as a woodland plant in our range; common on ballast near NYC; not recorded from s NJ.
Time of Fl. Jul-Oct; Aug-Sep at Cornell.
Origin. Native.
Remarks. Bright green in color.

Core (1967) suggests "It is possible that this and certain other species [of goosefoot] may have been used as potherbs [in southern Appalachia]. Lambs quarters (C. album) is now the favorite species, but it was not in America in prehistoric times." In areas where this species may have become an undesirable weed, Muenscher (1952) suggests that it can be controlled by clean cultivation, hoeing, or hand pulling before flowers appear.

Chenopòdium lanceolàtum Muhl. Narrow-leaved Goosefoot.

Meaning of Species Name. Lanceolate, from the shape of the leaves.
Type of Plant. An erect annual herb growing up to 1.5 m high, reproducing by seeds.
Habitat. Open woods, thickets, cult soil, and waste places.
Range. Nf to BC, s beyond our range.
Distr in NYS. Frequent or common across the state outside the higher Adirondacks.
Distr in the Torrey Range. Not recognized as a distinct species in Taylor (1915).
Time of Fl. Jul-Oct.
Origin. Fernald (1950) states that this species is natzd from Eu, while House (1924) was of the opinion that it is "apparently indigenous."

Chenopòdium missouriénse Aellen. Missouri Goosefoot.

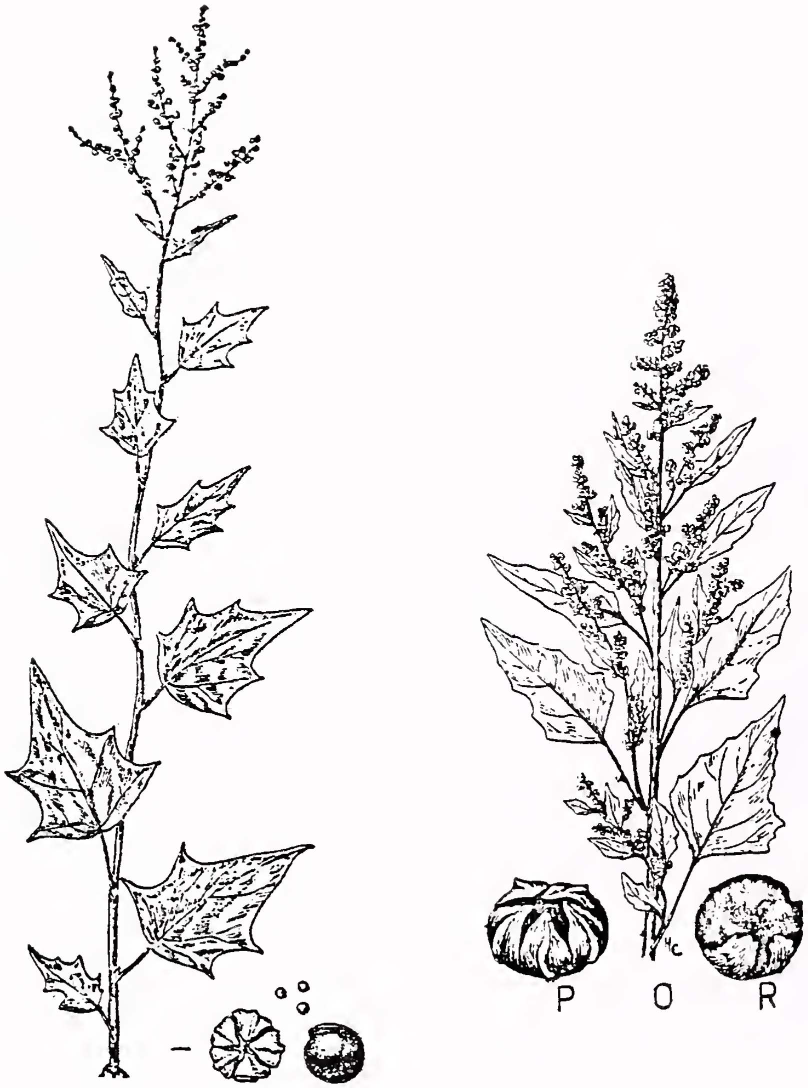
Meaning of Species Name. Of Missouri.
Synonyms. *C. berlandieri* Moq. in Fernald (1950).
Other Names. Berlandier's Goosefoot.
Type of Plant. An ill-scented slender annual herb, reproducing by seeds.
Habitat. Open wasteland.
Range. NC, Mo, and ND, s to Fla, Tex, and Mex; adv to NY, Ind, and Ill.
Distr in NYS. Sparingly natzd or adv from the sw about cities and towns of s NY, more rarely elsewhere.
Distr in the Torrey Range. Not listed in Taylor (1915).
Time of Fl. Jul-Oct.
Origin. Adv from the s states.

The strictly autumnal flowering of this species is considered an easy mark of recognition, helping to separate it from *C. album*, which begins to flower in June and July (May farther south).

Chenopòdium pagànum Reichenb. Bush's Goosefoot.

Meaning of Species Name. Of the country.
Synonyms. Included in *C. album* in Gleason (1952).
Type of Plant. An annual herb, reproducing by seeds.
Habitat. Rich cult fields and waste ground, especially about old buildings and the larger cities and towns.
Range. Que to Ak, s beyond our limits.
Distr in NYS. Occasional or locally frequent.
Distr in the Torrey Range. Not listed in Taylor (1915).
Time of Fl. Jul-Oct; Jul-Sep at Cornell.
Origin. Natzd from Eu.

The large reticulate seeds and large thin leaves, as well as the usually lead-gray, drooping, irregular inflorescences on plants that are often leafless by autumn, will help distinguish this plant from *C. album*.

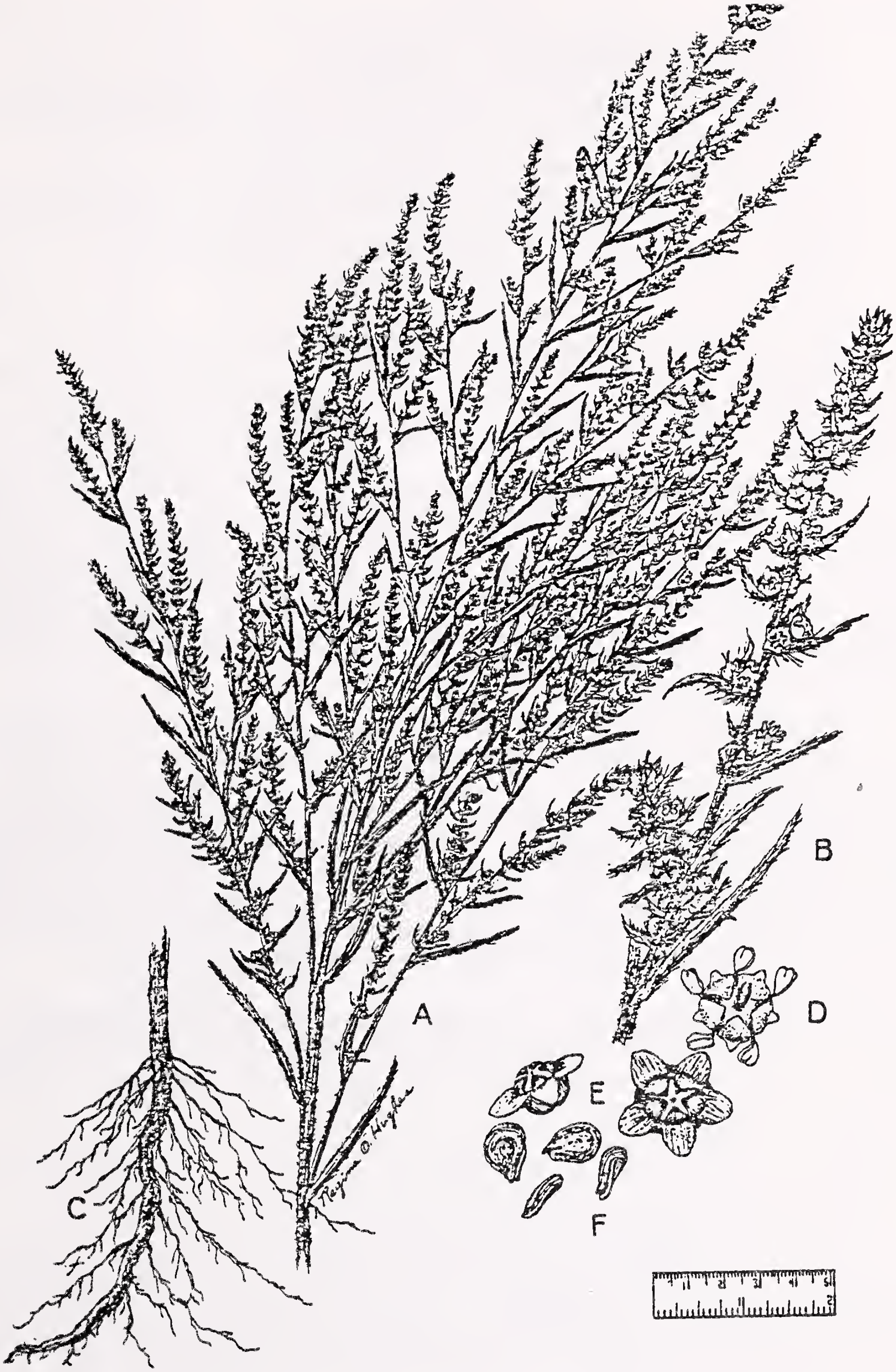


(Left) Chenopodium hybridum--Maple-leaved Goosefoot
[From Pammel (1913), Fig. 60, p. 106.]
(Right) C. paganum--Bush's Goosefoot
[From Muenscher (1952), Fig. 27, p. 209.]

In areas where this species has become an undesirable weed, it can be brought under control by clean cultivation and hand weeding in cultivated crops or by harrowing of cultivated fields and grainfields while the crop plants are small.

Kochia Roth. Summer-cypress.

There are about 35 species of Kochia, chiefly of the old world, but 3 species are native in the western states. The genus was named for Wilhelm Daniel Joseph Koch, 1771-1849, a German botanist. A variety of K. scoparia, a summer annual native to southern Europe, is cultivated for the beauty of its leaf coloring; during the summer months the leaves are light green, but they turn red or purple-bronze at the approach of autumn.



Kochia scoparia--Kochia
[From USDA Agr. Research Sv. (1971), Fig. 66, p. 137.]

Kòchia scopària (L.) Roth. Kochia.

Meaning of Species Name. Broomlike.
Synonyms. K. scoparia (L.) Schrad. in Gleason (1952).
Other Names. Burning-bush, Cypress-spurge, Fireball, Mexican Fireweed, Belvedere Cypress.
Type of Plant. An annual herb, reproducing by seeds.
Habitat. Waste places, ballast grounds, and occasionally in fields, mostly on dry soils.
Range. Widespread, but most common in the w states.
Distr in NYS. Infrequent; adv from Eu on LI, about NYC, and Rochester; occasional in cult.
Distr in the Torrey Range. Hartford, Ct, and Orient, LI.
Time of Fl. (Jul)Aug-Sep(Oct).
Origin. Natzd from Eurasia; with us probably adv from the w plains, although Fernald (1950) states "Spread from cult. from N.E. w. and s."

This is a serious drought-resistant weed of the plains states, particularly in Minnesota and North Dakota, south to Nebraska. Steyermark (1963) reports that in China and Japan this plant is cultivated as a seed plant for use as a cereal or in bread. The young shoots are there also cooked as a vegetable, and the entire plant, when dried, is used as a broom for sweeping. In the midwest pollen from this plant is considered responsible for causing hay fever.

Cultivated and escaped plants are less villous (sometimes even glabrous) than western plants, with leaves that are inconspicuously ciliate and commonly 3-5 cm long as compared with 1-3 cm for the western plants. Leaves of the cultivated plants turn bright red or purple-bronze in autumn. In addition, the western plants are much-branched while those that have escaped from cultivation are much more compact in growth. The Arkville specimen was an adventive waif from the west and not an escape from cultivation; it seems not to have become established in Arkville, for the writer has not seen it there since it was first collected in 1978.

Where this species has become an obnoxious weed, Muenscher (1952) suggests that it can be controlled by mowing early before seeds are matured. In cultivated ground hand weeding or hoeing as early as possible will keep it under control.

AMARANTHÀCEAE, the Amaranth Family

This is a family of 64 genera and about 800 species, widely distributed throughout the temperate and tropical zones but most abundant in tropical regions, especially in America and Africa. Nearly one-third of the genera are monotypic, five of which are indigenous in the new world. The dense or congested inflorescence usually provides a superficial clue to identity.

The amaranths have been presumed to be among the more primitive members of the order, but recent studies of the bracts and bractlets provide evidence that the basic inflorescence is a dichasium of three flowers, of which usually two have been lost and only the bractlets remain.

The views of Hutchinson and others that this family is not primitive but has evolved from caryophyllaceous ancestors seem to agree with existing data. Cronquist (1968) is of the opinion that "The Amaranthaceae are probably derived directly from the Chenopodiaceae, being more advanced in both ... the critical characters ... which mark them as a group." Economically the family is of little importance. It contributes few food products (the herbage of several species is edible as greens) and only a few ornamentals, including Prince's Feather (Amaranthus), Globe Amaranth (Gomphrena), and a red-foliaged form of Iresine. Several genera contain noxious weeds.

Amaránthus L. Amaranth.

There are about 66 species of wide distribution but most abundant in the tropics. They are coarse, chiefly annual plants with alternate and entire petioled leaves and small green or purplish flowers in axillary or terminal spiked clusters in late summer and autumn. The name of the genus is an ancient Greek name, amarantos, not fading or wilting, because the dry calyx and bracts do not wither. It was originally applied, however, to a species of Celosia. In ancient Greece the amaranth was supposed to have special healing properties, and as a symbol of immortality it was used to decorate images of the gods and tombs. Mature fruit is necessary for proper identification. Some 30 species of Amaranthus occur in North America, chiefly in the southern and southwestern United States, several of which are introduced weeds, mostly from the tropics.

The amaranths are very similar to Goosefoot (Chenopodium) in many respects and are often called "Pigweed"; they differ in having scaly inflorescences and more veiny, often hairy leaves and stems. The young plants are sometimes used as potherbs and the seeds as a breadstuff, these uses having been especially practiced by the Aztecs and the southwestern Indians. In the north their use has not been general; as potherbs, however, the larger species can be commended. They are often very common as garden weeds, and, gathered young, they make an excellent substitute for Spinach, but the young plants are very tender and care should be taken not to overcook them.

This genus contains several well-known garden plants, mostly of tropical origin, such as Love-lies-bleeding (A. caudatus), a vigorous hardy annual with dark purplish flowers crowded in handsome drooping spikes. Another species, A. hypochrondriacus, a native of India, is Prince's Feather; it has deeply veined, lance-shaped leaves, purple on the under side. The deep crimson flowers are densely packed on erect spikes. Globe Amaranth, also a native of India, belongs to an allied genus, Gomphrena. Some varieties of Amaranthus are also cultivated for their varicolored leaves.

Sturtevant (1919) lists 10 species that are used as potherbs in various parts of the world. A. paniculatus is extensively cultivated in India for its seed, which is ground into flour; "it will bear half a pound of floury, nutritious seed on a square yard of ground." A. retroflexus is still cultivated by the Arizona Indians for its seeds, which are parched and eaten whole or ground into flour. The leaves and stems of young plants of various species have been used as greens, not only by various tribes of Indians but by the early settlers as well.

Some species have slightly astringent properties, others are diaphoretics and diuretics, and a few are tonics and stimulants. A. caudatus is considered astringent and a decoction of the flowers has been administered in spitting of blood and various hemorrhages. It has also been used as an anthelmintic. The leaves of A. hypochrondriacus are also said to be astringent and were once used internally and topically in the complaints to which the astringents generally are applicable.

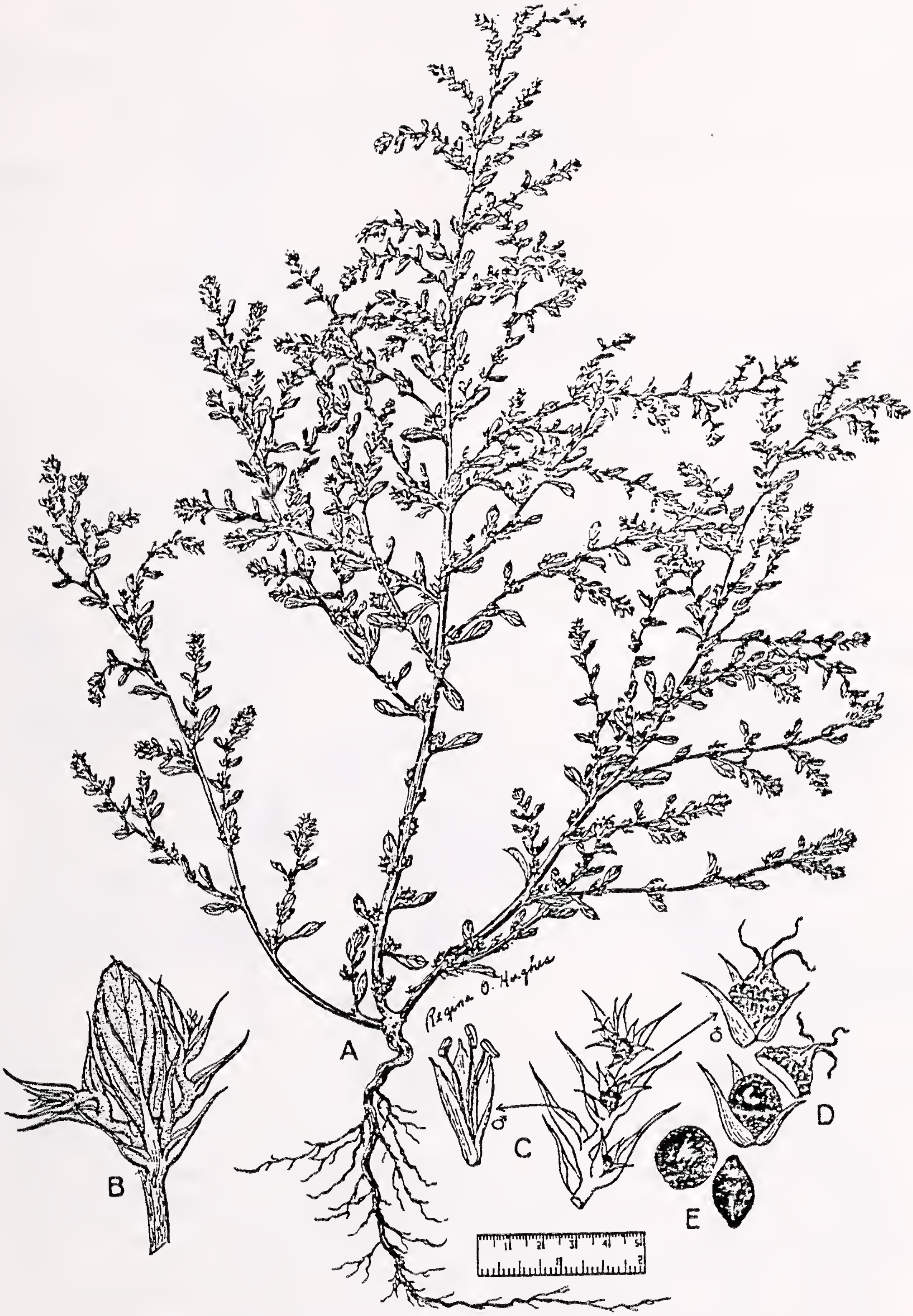
Pigweeds produce a tremendous number of small, shiny seeds; a total of 129,000 has been counted on a single plant. Some seeds persist in the densely clustered spikes and remain available for use by songbirds into the winter (and possibly until spring) when other foods are scarce. These despised common weeds are therefore an important source of food for many songbirds as well as being of considerable value for upland gamebirds and other wildlife species, including rabbits, mice, and deer.

Several species in this genus are common weeds of cultivated soil. Kingsbury (1964) reports that analyses have shown that they may accumulate dangerous levels of nitrate, poisonous to farm animals when consumed in large amounts. A. retroflexus and A. palmeri have been incriminated in cases of livestock loss.

Of A. hybridus, Green Amaranth, House (1924) remarks that it is "Frequent or common especially southward in the State," while Taylor (1915), speaking of its distribution in the Torrey range, states that it is "More common than the preceding [A. retroflexus], throughout the range." To date, however, no one seems to have collected or observed A. hybridus in the Catskill region. This species has been included in the following key on the chance that it may have been overlooked in the Catskill area.

Key to the Catskill Species of Amaranthus

1. Plants depressed or ascending, relatively slender, diffusely branched; leaves small, spatulate or obovate, with blades 0.5-7 cm long; flowers in small axillary clusters; stamens 2 or 3 (bracts subulate, pungent, much exceeding calyx and utricle [seed capsule]; utricle wrinkled; leaves toward ends of branches much reduced; seeds 0.7-1 mm broad.............................. A. albus
1. Plants erect or strongly ascending, relatively coarse, rough; leaves larger, petioled, ovate-lanceolate, with blades mostly 5-30 cm long; flowers in terminal and axillary simple or panicled spikes; sepals and stamens 5 (3 in A. powellii), 2
   2. Bracts thin, short aristate, not rigid, equaling or somewhat exceeding the utricle; sepals 1.5-2 mm long, shorter than or slightly exceeding the utricle (lateral spikes of terminal panicle divergent; sepals of pistillate flowers obtuse or rounded at apex; utricle longer than calyx)..... A. hybridus
   2. Bracts subulate, rigid, 5-8 mm long, usually twice as long as the utricle (seed pod), green; sepals at maturity conspicuously exceeding the utricle; lateral spikes of terminal panicle strongly ascending, 3



Amaranthus albus--Tumbleweed
[From USDA Agr. Research Sv. (1971), Fig. 69, p. 143.]

3. Plant finely villous; terminal panicle usually lobulate, with crowded lateral spikes 1-5 cm long; sepals of pistillate flowers round-tipped, truncate, often notched at tip and mucronate, appressed; stamens 5.................................... *A. retroflexus*

3. Plant nearly glabrous; terminal panicle with stiff, much prolonged central spike; the few lateral spikes also long, erect, and often 4-12 cm long; sepals of pistillate flowers sharply acute; stamens usually 3.................................. *A. powellii*

Amaránthus álbus L. Tumbleweed.

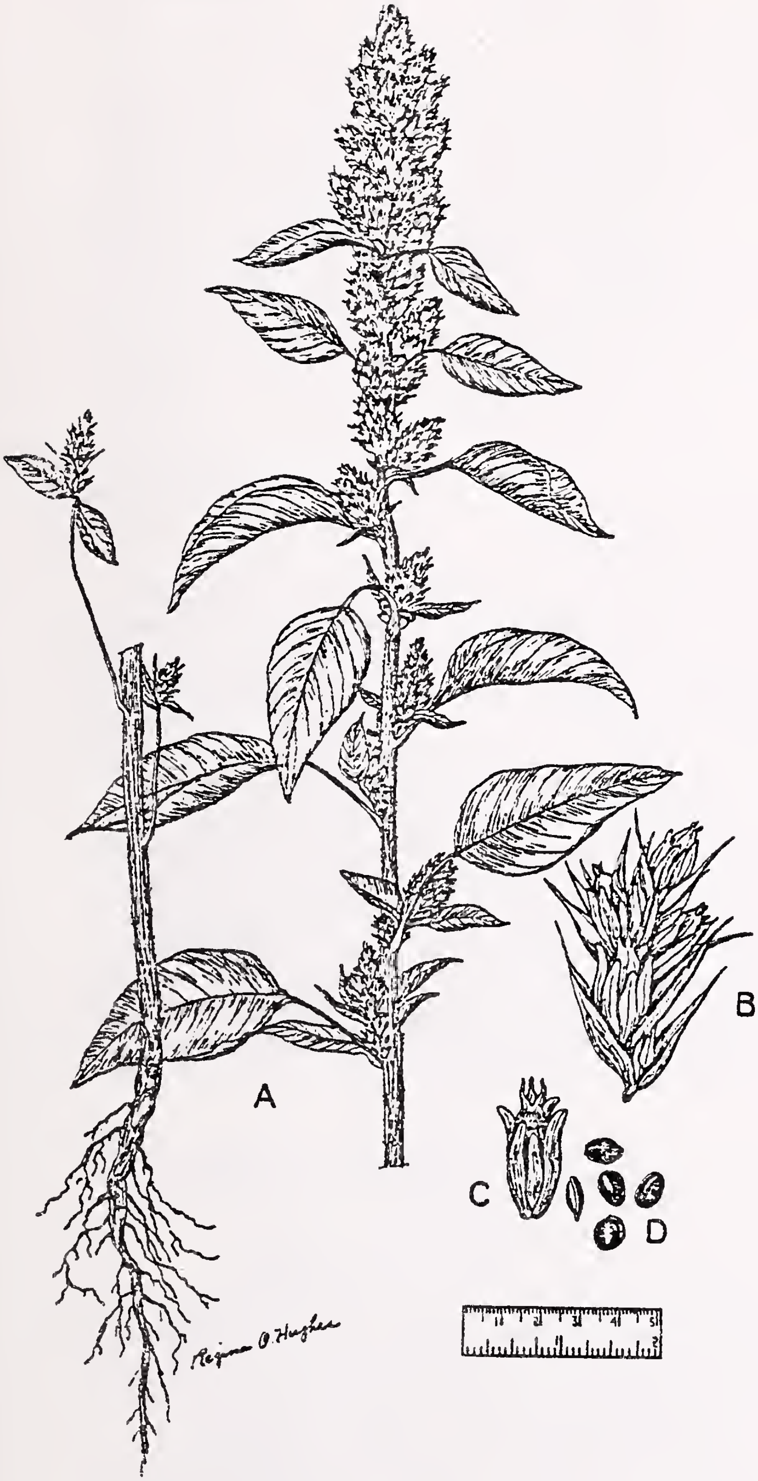
Meaning of Species Name. White.
Type of Plant. An annual herb, reproducing by seeds.
Habitat. Fields, waste places, and disturbed soil.
Range. Widespread throughout NAm except in the colder parts.
Distr in NYS. Common or frequent as a natzd weed, especially about cities and towns.
Distr in the Torrey Range. Not listed in Taylor (1915).
Time of Fl. Jul-Oct.
Origin. Originally probably native only in the prairie states and the Great Plains reg; adv from the w states in our area.
Remarks. A semicosmop weed originally described from Va.

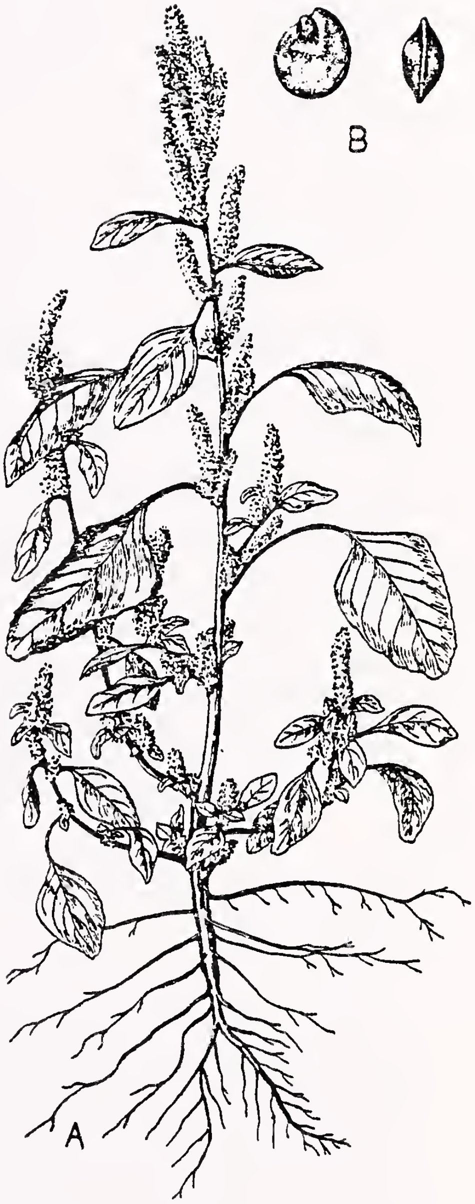
Amaránthus powéllii S. Wats. Powell's Amaranth.

Meaning of Species Name. Named for its discoverer, John Wesley Powell, 1834-1902.
Type of Plant. An annual herb, reproducing by seeds.
Habitat. Waste places.
Range. Me to Pa; native from SD to Ore, s to w Tex and Cal.
Distr in NYS. Not listed in House (1924).
Distr in the Torrey Range. Not listed in Taylor (1915).
Time of Fl. Aug-Sep.
Origin. Adv from the w US and Mex.
Remarks. Gleason (1952) states that it is "reported as adv in Mass."

Amaránthus retrofléxus L. Red-rooted Amaranth.

Meaning of Species Name. Bent backward or turned down, referring to the drooping leaves.
Other Names. Pigweed, Rough Pigweed, Amaranth Pigweed, Redroot, Chinaman's Greens, Green Amaranth, Careless Weed, Beet-root, Wild Beet.
Type of Plant. An annual herb, reproducing by seeds.
Habitat. Gardens, cult fields, and waste places.
Range. Essentially throughout the US; also in the old world.
Distr in NYS. A common weed.
Distr in the Torrey Range. Common throughout the range but often locally rare.
Time of Fl. Aug-Oct; Jul 20-Sep at Cornell.
Origin. Natzd from trop Am.
Remarks. As many as 115,600 seeds have been obtained from one plant.





(Left) Amaranthus retroflexus--Red-rooted Amaranth
[From USDA Agr. Research Sv. (1971), Fig. 71, p. 147.]
(Right) Amaranthus powellii--Powell's Amaranth
[From Muenscher (1952), Fig. 28, p. 216.]

Originally a native of tropical America, this plant has become a common weed throughout the United States and southern Canada. In spite of its bristly appearance, the leaves are tender and when picked very young, only a few inches high, Red-rooted Amaranth makes a "quite passable" potherb with a mild flavor. Like Lamb's-quarters, it can usually be found in the young stage from spring until fall. Some people consider it too tasteless, but that may be one of its virtues, for it can be mixed with other greens that have too strong a flavor, thereby toning them down a bit. Even when cooked alone, however, it provides an excellent substitute for Spinach, particularly when sprinkled with soy sauce. Cooked with bacon fat, these greens can provide a special treat. First boil the tender young plants for 3 to 5 minutes, then drain. Meanwhile fry one piece of bacon for each serving, remove bacon, and reserve about 2 tablespoons of bacon fat in the pan. Transfer the drained greens to the pan, add a little salt, stir the greens to coat them evenly with fat, cover, and allow them to steam for about 5 minutes. Remove from the fire, add 1 tablespoon of cider vinegar, and toss the greens again. Serve in individual dishes garnished with a slice of bacon and some thin slices of hard-boiled egg. _A. hybridus_ can also be used for this dish.

Indians of the southwest are reported to have cultivated the Red-rooted Amaranth as a grain crop, the shiny black seeds being parched or ground into meal, which was baked in cakes or used for porridge. Core (1967) states that Indians of the southeastern states "apparently cultivated some species of _Amaranthus_ for the seeds, gathered and eaten parched or made into meal, sometimes mixed with corn. The young plants were also used as potherbs." Those wishing to experiment with these seeds should gather the fruiting spikes when they first get dry in the fall, for they soon drop their seeds. Place the spikes in a large durable plastic bag, put the bag on the floor, and thresh out the seeds by walking on it, then winnow out the trash on a breezy day. Gibbons (1962) experimented with these seeds and reported that finely ground and mixed with wheat flour, they "make acceptable dark pancakes, muffins, and biscuits." These products have a somewhat "mousey" odor and taste, however; their flavor was greatly improved when he first parched the seeds for about an hour in a medium oven before grinding them, stirring occasionally so they would cook evenly.

Krochmal and Krochmal (1973) report that the leaves have been used for washing clothes because of their high saponin content, in addition to their medical use in the treatment of internal bleeding, diarrhea, and excessive menstrual flow.

Chemical analyses have shown that pigweeds may accumulate dangerous levels of nitrate, poisonous to farm animals when consumed in large amounts. _A. retroflexus_ has been incriminated in cases of livestock loss by nitrate poisoning. In areas where it is abundant, late summer cases of hay fever have also been attributed to pollen from this plant. Land infested with this species should be harrowed several times in the spring to induce the seeds to germinate, followed by a clean cultivated crop with hand weeding or hoeing to prevent stray plants from producing seeds. A crop rotation including alfalfa or clover is also effective.

PHYTOLACCÀCEAE, the Pokeweed Family

This is a family of about 17 genera and 125 species, largely of the American tropics and subtropics, of which Phytolacca is the largest genus. Cronquist (1968) remarks that "The Phytolaccaceae are clearly the most primitive family of the Caryophyllales, from which all "the other families of the order might well have been derived directly or indirectly." Three genera have species indigenous to this country, two of which are confined to the southern states. Economically the family is of little significance. Two species of Phytolacca and Rivina humilis are grown for ornament, as also are species from three other genera. Young shoots of Pokeweed are a source of edible "greens" or potherbs. Our one species has berry-like fruits with colored juice and pulp.

Phytolácca L. Pokeweed.

There are about 35 species of Phytolacca, tall, stout perennial herbs, trees, or shrubs of tropical and warm regions, with large petioled leaves and terminal racemes that become lateral and opposite the leaves. The name of the genus is derived from the Greek phyton, plant, and the middle Latin lacca, crimson-like, in allusion to the crimson coloring matter which the berries yield.

Very few species are in cultivation, but P. dioica, the Umbra, a native of South America, is a handsome quick-growing tree that is planted for ornament in California and in other mild climates. Indian Poke, P. acinosa, a native of the Himalayas and China, is cultivated in India, where its leaves are prepared as a boiled vegetable. In 1852 it was cultivated in Germany as a spinach plant and was later introduced in France as a culinary vegetable, but it does not appear to have met with much success in spite of the fact that its leaves and young shoots are reputed to be of excellent flavor. P. octandra, a native of Guyana and Jamaica, also furnishes palatable, wholesome greens, in 1812 found cultivated in most of the kitchen gardens in Jamaica.

Phytolácca americàna L. Pokeweed.

Meaning of Species Name. American.

Other Names. Poke, Scoke (or Skoke), Garget, Pigeonberry, Pokeberry, Virginia Poke, Inkberry, Red-ink Plant, Coakum, Jalop, American Nightshade, Phytolacca Root, Phytolacca Berry, Branching Phytolacca, Bear's Grape, American Spinach, Crowberry, Cancer-root, Pocan, Coakan, Chongrass.

Type of Plant. A perennial herb, reproducing by seeds and buds from the root crown.

Habitat. Fields, fencerows, pastures, roadsides, waste places, and damp open woods, particularly in rich low ground.

Range. Me to Minn, s to Fla and Tex; introd into Eu.

Distr in NYS. Common.

Distr in the Torrey Range. Common throughout our range, nearly always as a weed.

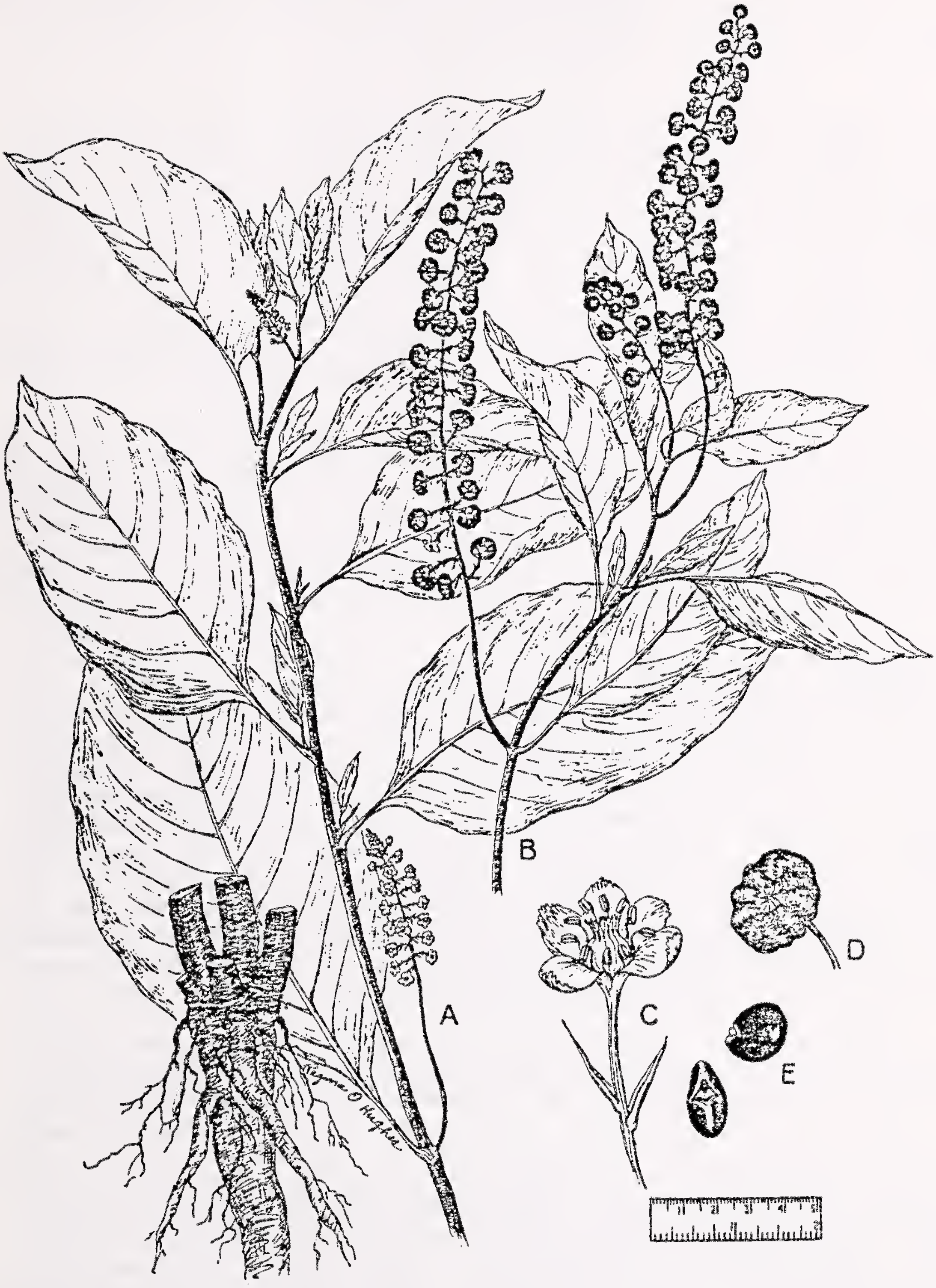
Time of Fl. Jul-Sep; Jul-Aug at Cornell.
Origin. Native.
Remarks. Rind of mature stem rich purple. The roots and mature foliage are poisonous, and the plant has a rather unpleasant odor.

Pokeweed or Pokeberry (from the American Indian pocan, applied to any plant yielding a red or yellow dye) is the common name of *Phytolacca americana*, a tall, strong-smelling perennial herb with ovate-lanceolate leaves, racemes of small greenish-white flowers, and flattish, dark crimson berries about one-fourth of an inch in diameter. In some areas it is extremely abundant, but records of its occurrence in the Catskills are not numerous. This is one of a number of American plants which had so many uses by so many different people that it is known by many different names, for most of which there are good reasons.

Considering the availability of this plant in many areas and its popularity in southern Europe and in the southern states as a desirable substitute for Asparagus or Garden Spinach, it is remarkable how few people in the north make use of it as a vegetable. The American Indians made wide use of it, and the early settlers were so impressed with it as a potherb that they sent its seeds to Europe, where it soon became a popular cultivated vegetable. Nearly all the earlier writers on American plants were enthusiastic about Pokeweed. In the southern states, as well as in Chester County, Pennsylvania, and in Philadelphia, the young shoots were at one time regularly available in the public markets, where they were sold under the name of "sprouts." In the United States it was usually not cultivated in the proper sense of the word, "although those who bring it into the markets are careful to allow it to maintain itself in the areas in which it becomes established." In 1817 Rafinesque reported that in Louisiana the leaves were eaten boiled in soup. Not only is it still a popular vegetable in the southern states, but it can also be found as a canned vegetable in stores specializing in gourmet foods.

Pokeweed is not a common plant in the Catskills, but there are areas where it is possible to gather the young sprouts when they are 8 to 10 inches tall. Wash and trim the sprouts, leaving the unrolled leaves at the top. Boil for 10 minutes in plenty of water, drain well, then add a very little water, some salt, and plenty of butter or bacon fat, and simmer slowly until tender. These greens can be served just as they are, combined with a cream sauce, or sprinkled with soy sauce. The thicker young stalks can also be fried. They are first peeled of the outer rind (which obviates the necessity for parboiling), rolled in corn meal, and fried in oil or fat. They can likewise be preserved for out-of-season use by boiling for 10 minutes, draining, then packaging for the freezer. Pokeweed sprouts can also be pickled.

There is a reason for throwing away the first water when preparing Pokeweed shoots for the table, for the plant contains poisonous principles. The mature stems, roots, and seeds are poisonous, so care should be exercised to gather only the young shoots for table use, trimmed so that no portion of the root is attached. The large root contains the largest amount of toxins; later in the season the purple rind, as well as the seeds (but not the juice or the pulp), are also poisonous. The young green



Phytolacca americana--Pokeweed
[From USDA Agr Research Sv. (1971), Fig. 72, p. 149.]

shoots do not have this purple coloring, however, and are perfectly wholesome and palatable as a vegetable, but in cooking it is a wise precaution to boil in two waters, draining off the first water in order to get rid of any possible extract from the developing rind.

In late summer and early fall the crowns of the roots bear a circle of almost innumerable incipient buds, so one of the most practical uses of Pokeweed is as a winter vegetable. Ten or 15 medium-sized roots (3 or 4 inches across) are dug up after the first heavy frosts in autumn, chopped off to a length of 6 or 8 inches, planted in a deep box of earth, and put in a dark cellar. By keeping the plants well watered, a succession of shoots is assured that may be allowed to grow a foot or more high without developing the purple coloring. After the first shoots are cut, they are quickly replaced by a continuous series of new and equally strong shoots, ensuring a weekly supply of "Asparagus" for three months or more, making a decidedly welcome addition to the mid-winter diet.

The juice of the handsome 10-scalloped berries is a beautiful concentrated red-purple that much intrigued the early settlers, who not only made use of it to color frostings, candies, and preserves, but employed it in inks and experimented with it as a source of dye for woolens. Several Indian tribes used the berries as a source of dye, and, during the late 1700's and early 1800's, the dye extracted from poke berries seems to have been much used by home dyers. The juice, boiled in rain water and set with an alum mordant, imparts to wool a beautiful crimson; when fixed with limewater, it produces a yellow color; and with urine, it dyes blue. Unfortunately these colors are not fast, and professional dyers of the time largely disregarded it because the colors were so short-lived. The juice of the berries was also used to impart a richer color to wine. In 1783 it was reported that "The Portuguese had formerly a trick of mixing the juice of the berries with their red wines, in order to give them a deeper colour," but this practice so debased the flavor that it was later prohibited by law. In Pennsylvania, on the other hand, the juice of the berries was once used with whiskey to make a so-called "port wine." It is also reported that the berries have been used in making pies and tarts. While the seeds are generally regarded as being poisonous, it is possible that the cooking process may eliminate any toxins present, but it would probably be wise to refrain from using the fruit as food.

Early settlers of this country were also much impressed by the medicinal qualities of Pokeweed, and both the laity and physicians of that time thoroughly explored its possibilities. The medicinal uses of this plant were learned from the Indians, who valued the plant not only as an emetic but also as an efficient remedy in gonorrheal and syphilitic diseases. In addition, some tribes used the powdered root as a poultice for swollen glands, a practice which was followed by early settlers in making a salve that was applied to an inflammatory condition of cows' udders called garget. Farmers made up a mixture of the dried root and lanolin (wood oil) to rub into the cow's udder to reduce caking and swelling, said to be one of the best remedies known. Some tribes applied the roots to the hands and feet of a person afflicted with fever, and others drank a tea of the boiled berries to cure rheumatism. Whites often soaked the dried berries in whiskey to make a tincture also used as a remedy for rheumatism.

Many early doctors followed Indian practices and also discovered other uses for this plant. Dr. Schoepf, a Hessian doctor during the Revolutionary War who later elected to remain in the United States, listed the root as an anodyne, among other things, and recommended a tincture in the treatment of carcinoma. Dr. Barton called the berries a popular remedy for rheumatism and found the juice of the berries useful in scrofula and "cancerous ulcers." Dr. Clapp considered Pokeweed to be emetic and purgative, but its problems, among which were slowness to begin its operation and the difficulty of suspending its cathertic action when once begun, ultimately led to the use of other drugs for that purpose; nevertheless it was considered the proper cathartic for use in partial paralysis of the bowels.

Another difficulty was that it acted as a narcotic upon the nervous system; overdoses resulted in feeble pulse, vertigo, and prostration followed by convulsions, in at least one case resulting in death, said to be caused by paralysis of the respiratory organs. In small doses, however, it acts as an alterative and was highly recommended in the treatment of chronic rheumatism, cutaneous diseases, and secondary syphilis, although later there was doubt that the root would cure syphilis without the help of mercury. An ointment prepared by mixing a drachm of the powdered root or leaves with an ounce of lard was used in the treatment of "itch" and other skin diseases. Pennsylvania Dutch used the plant for its laxative properties, and headaches "of many sources" were reported to be benefited by it.

Lighthall (n.d.), an Indian "medicine man," used a tincture of the root to treat sore throat and diphtheria, reportedly with satisfactory results. He dug the green root in July or August, washed it well, cut it into small pieces, filled a pint or quart bottle half full of the root, then added diluted alcohol. The bottle was shaken every day for 14 days, when the tincture was ready for use. He prescribed a dose of from 3 to 10 drops three or four times a day. He also prepared a tincture of the fresh berries in the same way, mashing the berries before adding the alcohol. Of this preparation he prescribed a teaspoonful four times a day. He also roasted the green root and mashed it to make a poultice, which he regarded as a specific for use in the treatment of all glandular troubles. In some areas three dozen crushed berries were added to 1 pint of boiling water, cooled, then strained to make a medicine for "purifying the blood," administered at the rate of 1 tablespoon a day whenever anyone was troubled with pimples or boils. Pieces of the cut-up root have also been added to chicken's drinking water in the belief that it would protect them from disease.

An extract made by evaporating the expressed juice from the fresh leaves at one time acquired considerable repute as a remedy in malignant tumors, but Millspaugh (1887) reported that "its success in the cure of these terrible maladies never became notable." The dried root was official in the U.S. Pharmacopeia, 1820-1916, and in the National Formulary, 1917-47, while the berries were official in the U.S. Pharmacopeia, 1820-1905. These and other parts of the plant were used in medicine as an alterative, for treating skin and blood diseases, and for the relief of pain and inflammation. This species is still in current demand as a drug plant.

Weiner (1972) reports that Pokeweed is presently being evaluated for its snail-killing properties. A related African species has demonstrated molluscicidal properties, and it is hoped that our native plant may be found useful in the control of fresh-water snails.

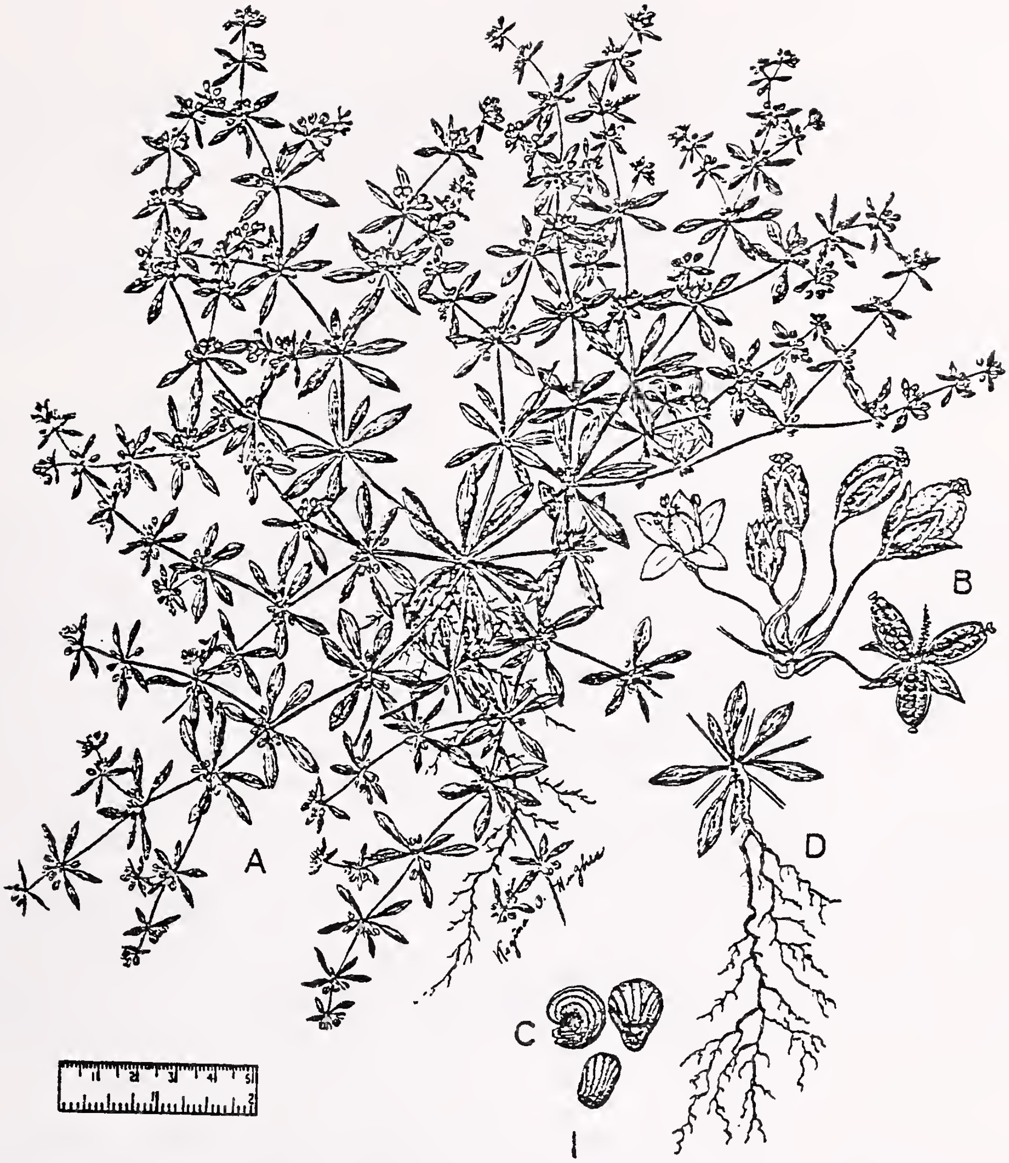
Kingsbury (1964), a noted authority on poisonous plants, states that references to the poisoning of children by the berries are not conclusive. Occasional poisoning of humans has resulted "from ill-advised treatments or accidental ingestion of pokeroot," when inexperienced "naturalists" have eaten Pokeweed without proper boiling. Poisoning of animals is rare, partly because the most toxic part of the plant is underground and partly because farm animals do not find the plant particularly palatable, but in Indiana and Alabama pigs have been poisoned by eating the roots. The berries are readily eaten without apparent toxic effect by wild birds, and feeding experiments have demonstrated that they are harmless to domestic fowl, but it is reported that, when consumed in large quantities, they impart an unpleasant flavor to the flesh, also causing it to become purgative when eaten. It is possible that the shoots and leaves also contain poisonous principles, but, when they are boiled, the poison is steeped out and poured off with the first water when the greens are made ready for the table. In any case, they are considered safe if the first cooking water is discarded.

The dark purple berries and large, shiny black seeds are popular with songbirds in the fall and are an important source of food for the mourning dove, but some birds have been reported to become "intoxicated" from eating Pokeweed berries.

In areas where this species has become an undesirable weed, it can be controlled by plowing up badly infested grasslands or meadows and planting a cultivated crop for one or two years. In pastures or waste places where plowing is not practicable, scattered plants are easily destroyed by cutting them below the crown with a spud or spade.

AIZOÀCEAE, the Mesembryanthemum Family

As traditionally conceived this is a large family, particularly in South Africa. The number of genera now recognized exceeds 100, with about 600 species, of which about 100 belong to the single genus Mesembryanthemum. This large group of South African succulents, becoming popular in cultivation, is by some authorities segregated into nearly 100 distinct genera. Some 7 genera occur in the United States, primarily in the southwestern and Pacific states. The family is of domestic economic importance largely for their ornamentals, as species of about 80 genera are cultivated as novelties. One species, New Zealand Spinach, Tetragonia expansa, is cultivated to a limited extent as a source of edible greens. Cronquist (1968), however, segregates the Molluginaceae (consisting of about 100 species) as a family distinct from the Aizoaceae, in which it has long been submerged. On that basis the Molluginaceae should be known as the Carpetweed Family, while the Aizoaceae should be designated as the Mesembryanthemum Family, since Mesembryanthemum is the dominant genus of that taxon.



Mollugo verticillata--Carpetweed
[From USDA Agr. Research Sv. (1971), Fig. 73, p. 151.]

Mollùgo L. Indian Chickweed.

There are about 15 species of Mollugo. They are low, rather inconspicuous, much-branched annuals of temperate and tropical regions (mostly tropical); stipules are lacking. The name of the genus is an old name used by Linnaeus for plants with whorled leaves. Mollugo hirta, a plant of tropical and subtropical regions, was in 1826 a common potherb in upper India.

Mollùgo verticillàta L. Carpetweed.

Meaning of Species Name. Whorled.
Other Names. Indian Chickweed, Whorled Chickweed, Devil's-grip.
Type of Plant. An annual herb, reproducing by seeds.
Habitat. Sandy riverbanks, roadsides, gardens, lawns, and waste places.
Range. Nearly throughout temperate NAm.
Distr in NYS. A common weed in most parts of the state.
Distr in the Torrey Range. Locally common as a weed throughout most parts of the range.
Time of Fl. Jun-Sep; Jul-Sep at Cornell.
Origin. A weedy immigrant from trop Am.
Remarks. A common weed that is rapidly migrating northw.

This plant might be confused with Purslane or with the Spotted Spurge, both of which have much the same habit of growth, but Purslane has smooth, thick stems and leaves and Spotted Spurge has a milky juice. All three of these plants are likely to be found together, as they all occur in the rich soil of cultivated fields and gardens. Carpetweed lies closer to the ground than the other two, its stems are swollen at the nodes, and its leaves are in whorls.

This depressed, branching plant with slender stems, whorls of narrow leaves, and insignificant axillary flowers that later develop into 3-celled capsules, can be cooked and eaten, but it is too insignificant for most people to bother with except as an emergency food. Like the Dandelion and other low-growing plants, Carpetweed is constructed so that it can make and use the maximum amount of food with the expenditure of a minimum amount of energy. All its leaves lie in the highest concentration of carbon dioxide to be found in the free atmosphere. Carbon from the carbon dioxide in the air and water from the soil are made into the sugar and starch that furnish the energy required by the plant for its growth and seed production.

In areas where this species has become a troublesome weed, it can be controlled by clean cultivation continued until late in the season; hand hoe or pull out scattered plants.

PORTULACÀCEAE, the Portulaca Family

This is a family of 16 genera (Abrams recognized 20) and more than 500 species, of wide distribution but most abundant in cool climates. The Pacific coastal states constitute one center of distribution for the family and southern South America is another. Within the Portulacaceae, Lawrence (1951) remarks that "those genera with few stamens are probably more primitive than those characterized by a presumed splitting of stamens into many." Economically the family is domestically important because of its ornamentals, notably the Rose Moss, Portulaca grandiflora, as well as a number of species from other genera. Several species of Lewisia are popular in rock gardens. Portulaca oleracea is used to a limited extent as a potherb and salad green.

Key to Catskill Genera of Portulacaceae

1. Plants weakly ascending; leaves 2, elongated, 2.5-5.5 cm long, opposite; flowers solitary and pediceled or in racemes or cymes; capsules opening lengthwise by 3 valves; stamens 5; a spring-flowering woodland plant.. Claytonia
1. Plants prostrate; leaves many, small, obovate or wedge-shaped, less than 2.5 cm long, alternate; flowers solitary or crowded, sessile or nearly so, closely subtended by the upper leaves; capsule circumscissile, opening by a lid; stamens 7-12; a summer-flowering garden weed... Portulaca

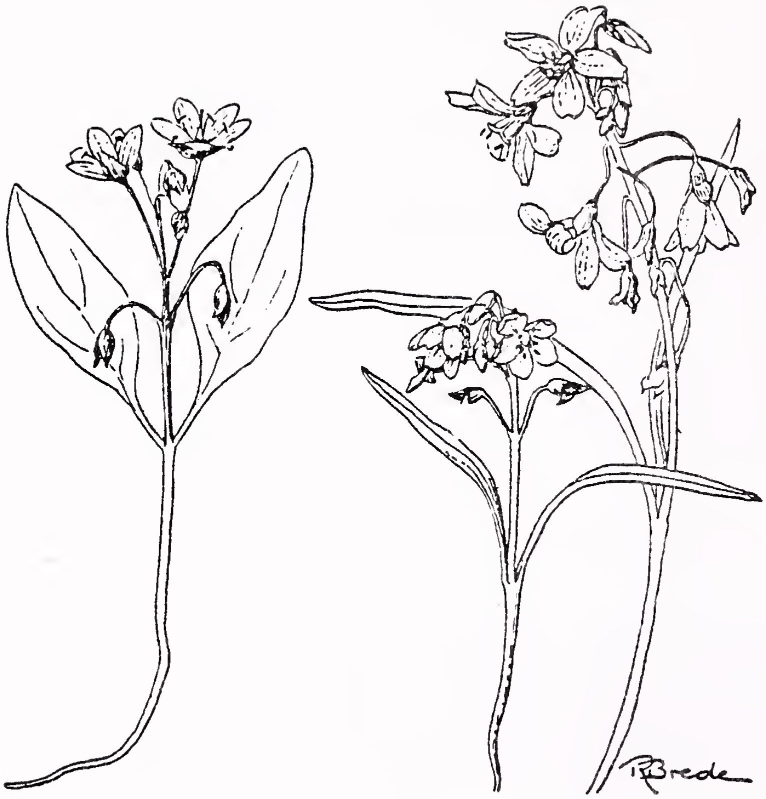
Claytonia L. Spring Beauty.

There are some 20 species of *Claytonia*, perennials of North America, Asia, Australia, and New Zealand, our single Catskill species sending up simple stems in early spring from a small deep-seated corm. These stems bear a pair of opposite leaves and a loose raceme of showy flowers. Both stems and leaves disappear by early summer. The genus was named to honor John Clayton, 1685-1773, one of our earliest botanists, who sent material to Gronovius that served as the basis for *Flora Virginica*. Gardeners find this species suitable for moist, semishaded parts of the wild garden and for the rock garden. They can be propagated by seeds sown in fall or early spring or by digging up the corms in spring and replanting them.

A number of species provide edible leaves or corms. The succulent leaves of *C. exigua*, a plant of California, were once popular as a potherb in that area. Johnston (1970) states that corms of *C. lanceolata*, the Western Spring Beauty, were dug by the Blackfoot Indians of the northwestern Great Plains region for use as food and were eaten fresh or roasted. Cuban Spinach, *C. perfoliata*, an annual, has been cultivated in France as a salad plant and has been used like Spinach in England. Siberian Purslane, *C. siberica*, is relished both raw and cooked by the Indians of Alaska, while *C. tuberosa*, a native of Kamchatka and eastern Siberia, has edible corms. Both *C. caroliniana* and *C. virginica* have edible corms that were much prized by the Indians.

The Platt list of 1840 enumerates both *C. caroliniana* and *C. virginica*, but there are no subsequent records of the occurrence of the latter either in Delaware County or in the Catskill region generally. There is a possibility, however, that it may yet be found in that region at lower elevations. The two species are distinguished as follows:

1. Leaves broadly oblong-lanceolate or spatulate-oblong, 2-5 cm long; petiole and blade clearly differentiated; bract at base of lowest pedicel scarious, 1.5-3 mm long, 1.5-3 mm broad......... *C. caroliniana*
1. Leaves linear-lanceolate, 7-15 cm long; petiole and blade scarcely or not differentiated; lowest bract firmly herbaceous, 2-10 mm long, 2-6 mm broad.. *C. virginica*



(Left) Claytonia caroliniana--Broad-leaved Spring Beauty
(Right) Claytonia virginica--Narrow-leaved Spring Beauty
[From Smith (1966), Plate 43, p. 108.]

Claytòniana caroliniàna Michx. Broad-leaved Spring Beauty.

Meaning of Species Name. Of Carolina.
Other Names. Mayflower, Wide-leaved Spring Beauty, Carolina Spring Beauty.
Type of Plant. A perennial herb, reproducing from seeds and by buds from the older corms.
Habitat. Rich open woods, alluvial thickets, and upland slopes.
Range. Nf to Sask, s along the mts to NC and Tenn, n Ill, and Minn.
Distr in NYS. Common across the state northw, usually in upland woods; infrequent in the Ontario lowlands and rare in the s part of the state; not reported s of Putnam, Ulster, and Delaware co.
Distr in the Torrey Range. NY: Summits of the Catskills in Ulster, Delaware, and Greene co.
Elevation. Grows to 5000 ft in Va; 322-4020 ft in the Torrey range.
Time of Fl. May-Jul (northw); Apr 15-May 15 at Cornell.
Origin. Native.

Spring Beauties literally carpet the ground in many areas of the Catskills, adding not only beauty to the early spring woods but also a delicate fragrance to the air. Most people do not realize that these plants spring from corms some one-half to 2 inches in diameter buried 2 to 4 inches in the ground. These roundish, irregular corms, when boiled in salted water, were once much prized by the Indians, for they are palatable and nutritious. After cleaning them well, boil them 15 or 20 minutes with their jackets on, then drain. As soon as they are cool enough to handle, peel off the skins. They can be eaten "as is," fried, mashed, put in salads, or cooked with peas, like new potatoes. They have the sweetness and flavor of boiled chestnuts but are softer and smoother in texture. The succulent, opposite-leaved young plants are also a possible potherb, prepared as a substitute for Spinach. Spring Beauties reproduce both from seed and by buds from the older corms. When digging up these corms, take only the larger ones and replant the rest in order to conserve this lovely spring flower. Only in regions where the plants are superabundant, however, would the quantity be sufficient to warrant digging for the deeply buried corms. In some regions the plants cover many acres of wooded slopes or meadows, and there it is possible to dig enough corms to furnish a pleasant change in the spring diet.

Portuláca L. Purslane.

There are at least 100 species of Portulaca, a genus of wide geographical distribution but most abundant in tropical and subtropical zones. They are fleshy herbs with mostly scattered leaves. The name of the genus is an ancient Latin name, possibly applied to P. oleracea. Only two species are of horticultural importance. P. grandiflora, a native of Brazil with trailing stems, is often grown for its range of brilliantly colored flowers. They must be planted in full sun, however, for the flowers are ephemeral, opening only in the sunshine. Yellow Purslane, P. lutea, is used as a vegetable in the Society Islands and in New Zealand, while P. quadrifida is much used as a potherb in India. P. retusa, a native of the western states, is eaten by the Apache Indians.

The small seeds of the purslanes are much relished by birds and small rodents. Although the plants do not become large, their seed production is tremendous; 52,300 seeds have been counted on a single plant of P. oleracea.

Portuláca oleràcea L. Purslane.

Meaning of Species Name. Like a garden vegetable.

Other Names. Common Purslane, Pussley, Pursley, Wild Portulaca.

Type of Plant. An annual herb, reproducing by seeds and stem fragments on moist soil.

Habitat. Gardens, cult fields, and waste places, mostly on rich soil.

Range. Throughout the US and s Canada.

Distr in NYS. Common.

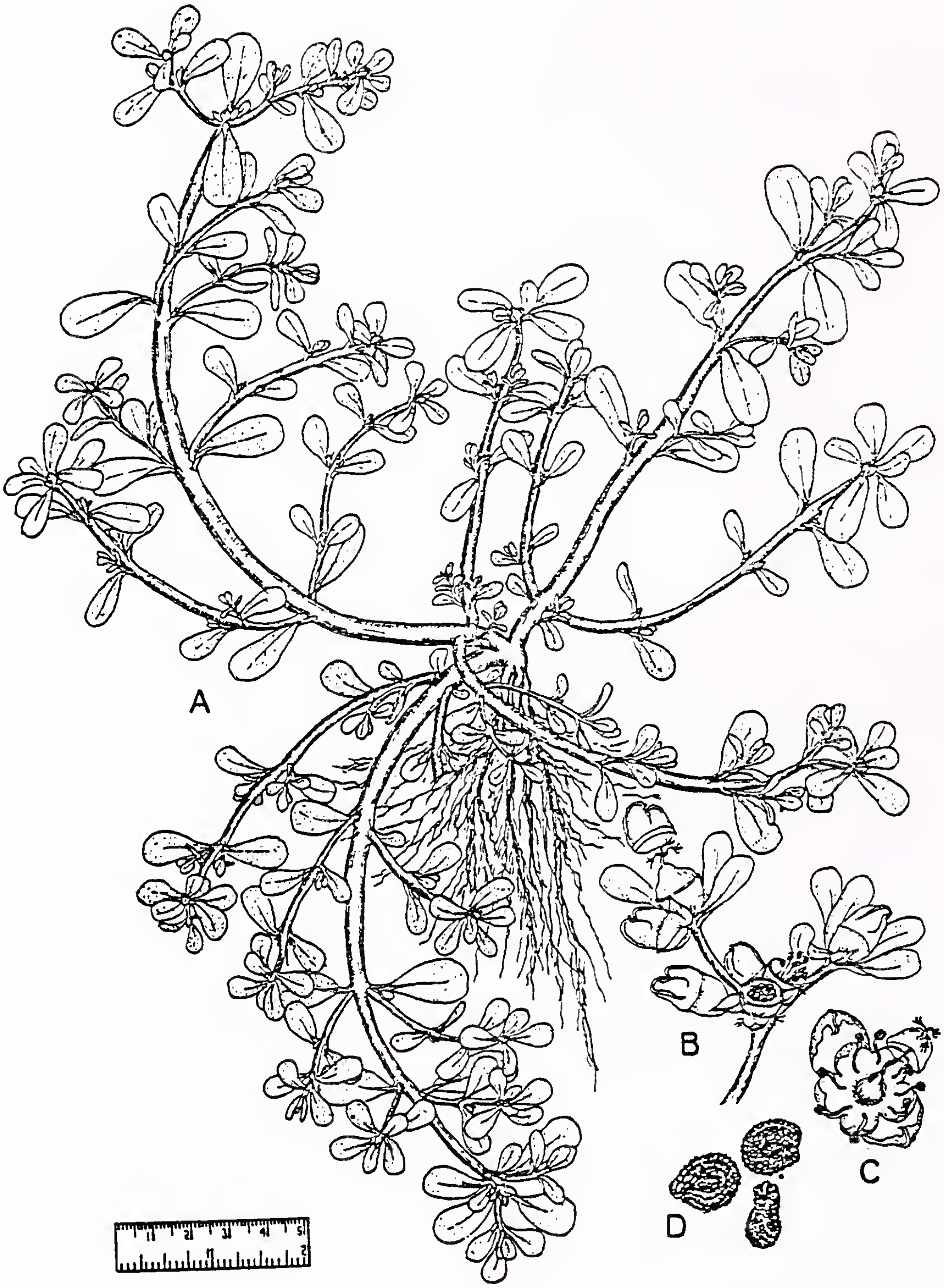
Distr in the Torrey Range. A troublesome weed throughout our area but often locally rare.

Elevation. Sea level-8500 ft.

Time of Fl. Jun-Nov; Jul-Sep at Cornell.

Origin. Natzd from Eu; House (1924) states that it is natzd from the s; the USDA (1971) states that it is introd from s Eu.

Remarks. By some authorities said to be a native of w Asia, but now widely distr throughout tem and trop lands.



Portulaca oleracea--Purslane
[From USDA Agr. Research Sv. (1971), Fig. 74, p. 153.]

This trailing annual with succulent reddish-purple stems and small flat leaves is thought to be a native of India and Persia, where it was used as a common potherb more than 2000 years ago. It is still a prized garden vegetable over much of Europe and Asia, and several different varieties have been developed. It is now a widely distributed plant of the Mediterranean region, by many considered to be the andrachen of Theophrastus and Dioscorides. Originally a native of tropical and subtropical regions (quite possibly of both hemispheres), it is now nearly a cosmopolitan weed. The fact that this plant reached England only in 1582 would seem to indicate that it was comparatively late in reaching northern Europe, although in 1536 Ruellius described an erect, green-leaved, cultivated form (P. oleracea var. sativa) as well as the wild, procumbent form.

The origin of the plants growing in the northeastern states is rather obscure. Some botanists are of the opinion that it became naturalized in this region from Europe during colonial times, since spreading nearly throughout this country and southern Canada. On the other hand, Champlain reported in 1605 that Indians along the coast of Maine brought him "purslane, which grows in large quantities among the Indian corn, and of which they made no more account than of weeds," indicating that the plant had already reached that area. House (1924) was of the opinion that Purslane was naturalized from the south. It therefore seems reasonable to assume that our plants include strains originally from the south as well as some from Europe.

It is in some respects rather surprising how many Americans are unaware of the esculent qualities of Purslane, since our ancestors, both in America and Europe, were fully aware of them. John Gerarde wrote during the 16th century that in England "Rawe Purslane is much used in sallads with oile, salt, and vinegar." In 1785 Manasseh Cutler stated that Purslane occurred in the cornfields of New England and that it was eaten as a potherb, "esteemed by some as little inferior to asparagus." In addition, early settlers of that region frequently pickled the succulent stems, in that manner preserving them for winter use when vegetables were at a premium. This was a practice no doubt brought from England, but most of the old English recipes for Purslane pickles are quite complicated and require considerable work. In his endeavors to simplify the process of making Purslane pickles, Gibbons (1962) combined 1 cup of white vinegar, 2 cups of cold water, 1/4 cup of salt, and 1/2 teaspoon of alum, thus preparing enough liquid to fill two pint jars. He then put a flower of dill, a clove of garlic, and a small red pepper in the bottom of each jar, packed the jars somewhat loosely with clean Purslane stems, put another dill flower on top, filled the jars with the prepared liquid, then sealed and stored them in a dark place for at least 1 month before using. To store for winter use, cover Purslane tips with boiling water, simmer for 5 minutes, drain in a colander, run cold water over them, pack in pint jars, and freeze at once.

In Europe Purslane continued to be enjoyed as a vegetable until well after the middle of the last century, for in 1855 C. McIntosh reported that in England the young shoots and leaves were used in summer salads, while the French and Italians used it in soups and pickles. In 1879 it was reported as being cultivated in Yemen, sold in bundles in Mocha, and in Burma used by the natives as a potherb, but in the early 1800's it was already beginning to lose favor in America in some areas, for in 1819 W. Corbett mentions it in his American Gardener as "a mischievous weed that Frenchmen and pigs eat when they can get nothing else." Nevertheless, many people, especially those of foreign birth, realize that the young leaves and stems, when cooked for about 8 to 10 minutes in boiling salted water, make a most palatable potherb, with little loss of bulk in cooking, so that a small patch of plants clipped of their new tips and allowed to sprout again, is sufficient to supply a moderate-sized family throughout the summer. As a matter of fact, in many "victory gardens" of World Wars I and II, the crop of Purslane probably had more food value than the ignorantly nursed or neglected garden vegetables. Dr. Coville, a botanist in the employ of the U.S. Department of Agriculture, wrote: "As a potherb it is very palatable, still retaining, when cooked, a slight acid taste. It can be heartily recommended to those who have a liking for this kind of vegetable food." The succulent leaves and young shoots are cooling in spring salads, the older shoots can be used as a potherb, and the thick stems that have run to seed can be pickled in salt and vinegar for use in winter salads. In Mexico it is still seen in the markets where vegetables are sold. It is also still cultivated in Holland and other European countries; mixed in equal proportions with Sorrel, it makes bonne femme, a well-known French soup. The tender juicy, slightly sour leafy tips can be used raw as a salad plant, either alone or with other salad greens, such as mint or Watercress. Purslane has a mild acid taste and a fatty mucilaginous quality which some people find objectionable, but that very characteristic makes it a valuable addition to soups and stews, like Okra or the Creole "gumbo filet," giving these dishes a desirable consistency.

The tender young tips, washed well, then boiled for 10 minutes and seasoned with butter and salt, make a very acceptable cooked vegetable, but they are even better when mixed with turnip tops, Dandelions, or such mustards as happen to be in season. They are likewise very good cooked with bacon. Cut up several pieces of bacon and fry them in a large skillet. When the bacon is done, add 1 quart of the young tips to the bacon, stir to coat them evenly with bacon fat, then cover and cook for 6 to 7 minutes before seasoning with salt and a little vinegar. To make a casserole (which masks the mucilaginous characteristic to which some people object), boil the tips 10 minutes in salted water, drain, chop fine, and stir in 1 beaten egg. Add as many bread crumbs as the mixture will dampen, season to taste with salt and pepper, then bake in a moderate oven until the top is nicely browned. For those who wish to experiment with somewhat more sophisticated recipes, Berglund and Bolsby (1971) give directions for making Purslane Mold, Small Purslane Dumplings, Spiced Purslane Leaves, Purslane in Cream Sauce, Purslane Pancakes, and Purslane and Liver Casserole.

Even the abundant seeds can be used, for, according to Dr. Edward Palmer, the seeds of this and related species were much used by Indian tribes of the southwest for making mush or bread. The plants were gathered, placed in large piles to dry, then pounded to free the seeds, after which they were ground up and stored for future use. They can be dried for a couple of weeks on large plastic sheets before beating out the seeds. Put them through a coarse sieve to remove the larger fragments of plants, and winnow out the small chaff on a windy day. The tiny black seeds can then be ground in a hand grist mill and mixed half and half with wheat flour to make pancakes or biscuits.

This plant was also once much used in medicine, highly recommended in the treatment of a number of complaints. Taken fresh, the expressed juice was reputed to be good for strangury (painful discharge of urine); administered with sugar and honey, it afforded relief for dry coughs, shortness of breath, and immoderate thirst. Culpepper reported that "Applied to the gout, it easeth pains thereof, and helps the hardness of the sinews, if it come not of the cramp, or a cold cause." It was used also as an external application in the treatment of inflammation and sores. The juice, with oil of roses, at one time was recommended for sore mouth, swollen gums, and as an agent to fasten loose teeth. In addition, the distilled water was prescribed for pains in the teeth, and the leaves, eaten raw, were supposed to be good for teeth that were "set on edge with eating of sharpe and soure things." The seeds, bruised and boiled in wine, were once given to children as a vermifuge, but the U.S. Dispensatory of 1865 reported them to be "tasteless and inert." It was then "considered a cooling diuretic" and was also "recommended in scurvy, and affections of the urinary passages."

It has been demonstrated that this plant occasionally accumulates high levels of oxalates, toxic to livestock. Kingsbury (1964) states that no cases of livestock poisoning have been reported in North America, but in Australia sheep exhibited symptoms of acute oxalate poisoning resulting from ingestion of Purslane; it was in that instance found to have an oxalate content of 9.3 percent.

This weed is so much a hot-weather plant that it never troubles early gardeners, but it can become quite a pest in the rich soil of gardens and cultivated fields after the beginning of July. In areas where this species has become an obnoxious weed, Muenscher (1952) suggests that it can be controlled in the seedling stage by frequent and continued shallow cultivation or hoeing to prevent the formation of seeds. Although seedlings rarely appear before warm weather, after most other weeds have been destroyed by cultivation, like most low-growing plants, they grow rapidly and quickly develop seeds, which continue to germinate until frost. It is therefore necessary to continue cultivation until late in the season in order to eliminate this plant. Plants that have blossomed should be gathered and burned or put in the compost heap, otherwise the fleshy stems will take root again and mature seeds. This weed can also be plowed under to enrich the soil.

CARYOPHYLLÀCEAE, the Pink Family

This is a family of about 80 genera and 2100 species, distributed throughout the world but most abundant in north temperate regions; it contains the prized Carnation and all its beautiful relatives. It is not the color of the flower that gives this family its common name but the fact that the edges of the petals of the flowers in a number of species are pinked like the Carnation. The name of the family is derived from Caryophyllus, which comes from the Greek Karyophyllon, the name of the Clove tree. It was chosen by Reichenbach to designate a family of plants containing several spicy-smelling flowers, one of which is Gillyflower (pronounced "jillyflower") or the Clove Pink, which smells like Cloves. The Mediterranean area is the principal center of distribution for the family, the largest genera of which include Silene (500 species), Dianthus (350 species), and Arenaria (160 species). This family is distinguished in part by the combination of opposite leaves associated with leaf bases connate and sheathing or connected by a line, swollen nodes, and the one-chambered capsule (rarely three-chambered in some species of Lychnis) dehiscing by valves or teeth.

Botanists have presented many views to account for the evolution of the Caryophyllaceae. With few exceptions these more or less fit one of two basic concepts: (1) that of Eichler (1875), who considered the family to have originated from the Phytolaccaceae by conversion of the outer stamen whorl to petals and of the outer carpel whorl to stamens; or (2) that of Wernham (1911), who considered the family to have evolved from ranalian ancestors and to have been the source of origin of the Primulaceae and such reduced families as the amaranths and chenopods. Lawrence (1951) was of the opinion that "The Wernham theory ... seems more nearly to represent the probable origin and relationships of the family." The family is divided into three well-defined tribes, which are distinguished by the character of the flower and the arrangements for ensuring pollination. Economically the family is important for the large number of ornamentals available from it. Notable among them are the florists' Carnation and perhaps 75 other species of the genus (*Dianthus*), Baby's-breath (*Gypsophilia*), Catchfly (*Silene*, Maltese Cross (*Lychnis*), Sandwort (*Arenaria*), and one or two species of *Cerastium*. Some species, such as *Saponaria*, are poisonous to livestock.

The medicinal usefulness of this family of more or less mild plants lies mostly in the saponin found in many of its species, but especially prominent in two, the European Soapwort (*Saponaria officinalis*) and the Spanish fleshy-leaved *Gypsophila* (*G. struthium*). This substance is detergent and is often used in the composition of soap. The plants in which this principle exists were once deemed nearly equal to Sarsaparilla as cleansers of the blood in syphilis and similar affections when the skin was involved; parillin, the active principle of Sarsaparilla, is similar in its properties to saponin. Several species of the genus *Silene* are considered to be anthelmintics, some measure of success having followed the use of the Fire Pink, *Silene virginiana*. Many species of pinks (*Dianthus*) were formerly used and esteemed as astringents and sudorifics, and one species, *D. plumarius*, was once considered useful in epilepsy, but all have fallen into disuse, their petals now being utilized only as a coloring matter for ointments and perfumes.

Key to Catskill Genera of Caryophyllaceae

1. Stipules present, scarious, 2
    2. Petals absent; style branches or stigmas 2; plants of open rocky places (leaves in 2's, opposite, flat, elliptic to oblanceolate) .... *Paronychia*
    2. Petals present, white; styles normally 3 or 5; introduced plants of waste and cultivated ground or natives of dry sandy, gravelly, or sterile soils, 3
        3. Styles and valves of capsule normally 5; leaves appearing whorled; introduced plants.............................. *Spergula*
        3. Styles and valves of capsule normally 3; leaves opposite but often with secondary fascicles of leaves; native plants of dry sterile soil................................. *Spergularia*
1. Stipules lacking, 4
    4. Calyx of separate sepals, not united at base, 5
        5. Styles 4 or 5, 6
            6. Sepals obtuse; capsule dehiscing by same number of valves as styles (4 or 5); valves not bifid.................. *Sagina*
            6. Sepals acute; capsules dehiscing by 10 teeth or 5 valves, each bifid, 7
                7. Petals deeply notched; capsules ovoid .... *Stellaria*

7. Petals shallowly notched (less than halfway); capsules cylindrical, dehiscing by 10 teeth.......................... *Cerastium*

5. Styles 3, 8

8. Leaves linear or linear-subulate; capsules dehiscing by 3 valves..................................... *Arenaria glabra*

8. Leaves broad, with expanded blades; capsules dehiscing by 6 teeth or valves.. *Arenaria*

4. Calyx with sepals united into a long or short tube, 9

9. Leaves awl-shaped (5-15 mm long, slender-pointed at tip); calyx green, urn-shaped, 3-cleft, 3.5-5 mm long (indurated in fruit, its lobes much overtopping the capsule); petals normally absent; flowers green.......................... *Scleranthus*

9. Leaves broader; calyx green, whitish, or pink, 5-25 mm long; petals normally present; flowers white, pink, or purple, 10

10. Calyx tube 30-40-nerved, with 1-3 pairs of scales or leaflike bracts at base.................................. *Dianthus*

10. Calyx tube faintly nerved or with 5-20 nerves, with no scales or leaflike bracts at base, 11

11. The elongated calyx lobes leaflike, longer than the calyx tube and extending beyond the rose-purple petals.. *Agrostemma*

11. Calyx lobes much shorter than the calyx tube, not extending beyond petals; calyx lobes less than half as long as the tube, 12

12. Some or all flowers male or female, the sexes of the flowers usually separated on different plants (dioecious)............................... *Lychnis alba*

12. Most of the flowers perfect, with both stamens and pistils in the same flower, 13

13. Styles 5; capsule with 5 valves, each with 2 teeth at summit............................ *Lychnis*

13. Styles 2 or 3; capsule with 3, 4, or 6 teeth at summit, 14

14. Styles 3; capsule with 3 or 6 teeth at summit..................................... *Silene*

14. Styles 2; capsule with 4 teeth at summit................................ *Saponaria*

Agrostémma L. Corn Cockle.

This is a monotypic genus, a tall silky annual or biennial native to the old world. The name of the genus is derived from the Greek agros, field, and stemma, crown or garland, meaning "crown of the field," alluding to the handsome flowers. Selected strains bearing showy rose-colored flowers are sometimes offered by seedsmen. Sown in early spring in a sunny location, these plants make an effective display and are useful as cut flowers.

Agrostémma githàgo L. Corn Cockle.

Meaning of Species Name. An old generic name formerly applied to another plant, Gith or Git (Nigella sativa), seeds of which were also used in medicine.

Other Names. Purple Cockle, Corn Rose, Corn Campion, Crown-of-the-field, Corn Mullein, Old Maids Pink, Corn Pink, Mullein Pink, Ray, Nigella, Zizany, Darnel, Tare, Gith, Lychnis, Githago, Lilium.

Type of Plant. An annual or winter annual, reproducing by seeds.

Habitat. Grainfields and waste places.

Range. Most abundant in the n part of the ne states and adjacent Canada, but extending s to Fla and La.

Distr in NYS. Frequent or occasional in most secs of the state, especially in cult areas.

Distr in the Torrey Range. Throughout the range but nowhere common.

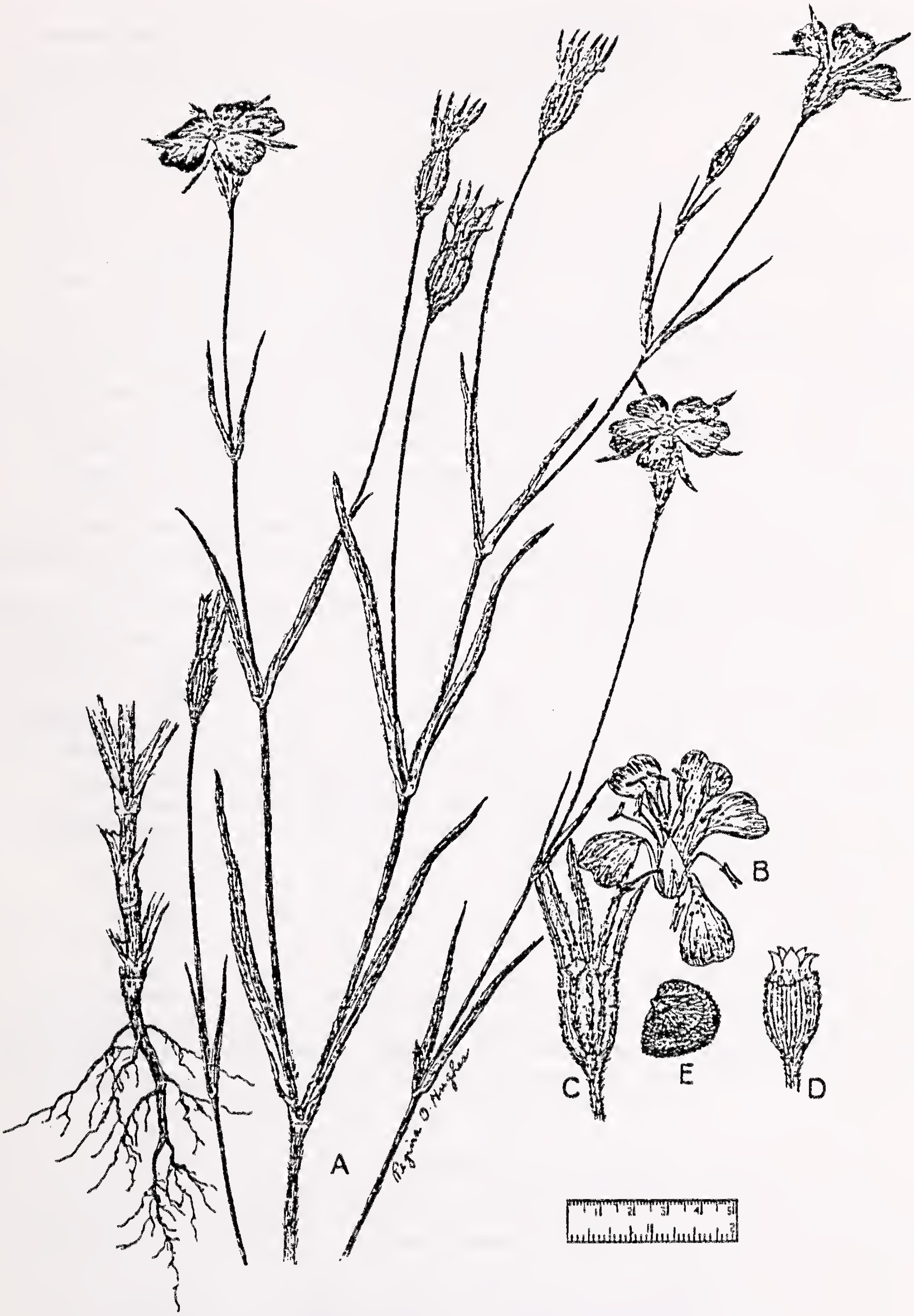
Time of Fl. (Jun)Jul-Sep; Jun-Aug at Cornell.

Origin. Natzd from Eu.

Corn Cockle was introduced into this country with grain from Europe and is very seldom to be found growing elsewhere than in grainfields, but it is a serious weed in the United States wherever winter wheat and rye are grown. It should be remembered that this plant, like so many of our weeds, brought its names with it from England. To the Englishman "corn" is wheat, not maize, so Corn Rose, Corn Cockle, Corn Campion, and Corn Mullein all refer to wheat, in the fields of which it is often an obnoxious weed. Crown-of-the-field and Old Maids Pink are two other names that appraise this weed's beauty rather than its worth, but selected strains of this species with showy, rose-red flowers are sometimes cultivated in flower gardens.

In the United States this weed is usually associated with fall-sown grain crops; it is most troublesome in the southeastern states from southern Pennsylvania, Ohio, and Illinois south to Florida and Louisiana. Its seeds ripen simultaneously with winter wheat and are therefore threshed out with it at harvest time. Before the advent of machinery for cleaning wheat, Corn Cockle seeds were often found as contaminants of wheat grain, for the seeds are so small that during the 1800's they were only with difficulty separated from the wheat. When ground with the wheat, the resulting flour was dark-colored, unwholesome, and bitter, producing a poorly rising bread with an unpalatable flavor. Flour made from such contaminated grain was known to be poisonous both to humans and livestock, so such grain had to be sold at a reduced price, causing losses to wheat growers amounting to several millions of dollars annually.

At one time this plant had some reputation in medicine, being used



Agrostemma githago--Corn Cockle
[From USDA Agr. Research Sv. (1971), Fig.75, p. 155.]

in the treatment of dropsy, jaundice, gastritis, and paralysis. Whatever medicinal qualities it may have had were no doubt due to its saponin content, most highly concentrated in the seeds rather than in other parts of the plant.

Kingsbury (1964) reports that information concerning the poisonous properties of Corn Cockle seeds is largely European in origin, but the death of cows, horses, hogs, and poultry in the United States has occurred under circumstances incriminating Agrostemma seeds. The poisonous principle is saponin, of which the seeds contain from 5 to 7 percent; presence of the seed coat appears to reduce the availability of the toxic principle. With current methods, Agrostemma seeds are separated from the wheat, so the danger now lies in feeding wheat screenings containing quantities of these seeds. Poultry usually find the seed unpalatable and will avoid them in whole-grain mixtures; Millspaugh (1887) reported that "not even the young chicks will pick up a single seed." Ducks and geese, on the other hand, seem not to avoid cockle seeds. Mash containing even small quantities of these seeds will be rejected by poultry but not by other livestock. Repeated eating of small doses of cockle seed causes poisoning called githagism; large doses cause acute poisoning, with symptoms characteristic of severe gastroenteritis.

The first step in bringing this weed under control is to make sure the seed planted is free from weed seeds. Farmers who want to rid their fields of cockle should take the only sure way of doing it: examine every inch of the fields containing the pest before the wheat is ready to harvest and remove every Corn Cockle stalk found, roots and all. In most fields the plant is very easily pulled up. If a field has become badly infested with Corn Cockle, practice a crop rotation in which wheat is not planted more than once in four years; hand pull scattered plants in grain fields before seeds are produced. Corn Cockle seeds rarely retain their viability for more than one year when plowed under in the soil.

Arenària L. Sandwort.

There are more than 200 species of Arenaria, of wide distribution in varied habitats. They are low, usually tufted, herbs with sessile exstipulate leaves and usually white flowers. It is sometimes difficult to identify certain species. The name of the genus is derived from the Latin arenaria, sandy, referring to the characteristic habitat of many species.

Many species that grow wild in various parts of Europe and North America are often planted in rock gardens. Some of the cultivated kinds include A. montana from Spain; it forms a dense mass of creeping stems and bears rather large white flowers in May and June. A. balearica, a wild plant of the Balearic Islands, will cover the shady side of a rock with a delicate tracery of tiny green leaves; it bears minute white flowers in May, but it is not quite hardy in the vicinity of New York City. In Iceland A. peploides, Sea Chickweed, is fermented and in that state used as food, like sauerkraut; the plant is also used as a pickle and makes a wholesome vegetable when boiled.

The only Catskill record for Arenaria stricta Michx. is an undated observation by Mary Domville made on Monka Hill near the site of the Grand Hotel in the Town of Shandaken, Ulster County. Unfortunately no specimen is available, but the writer has included an illustration of this species and retained it in the following key in the hope that more definite evidence may turn up of its occurrence in the Catskill region.

Key to Local Species of Arenaria

1. Leaves broad, with prominently expanded blades; capsules dehiscent by 6 teeth or valves, 2
   2. Leaves elliptical, blunt; petals exceeding the blunt sepals; seeds smooth, appendaged at the hilum; perennial..... A. lateriflora
   2. Leaves ovate, acute; petals not exceeding the acute sepals; seeds papillose, not appendaged; annual........... A. serpyllifolia
1. Leaves narrow, mostly linear, subulate, or bristle-like; capsules dehiscent by 3 valves, 3
   3. Sepals nerveless or obscurely nerved, broadly obtuse; leaves soft, not crowded; stem capillary, herbaceous; petals usually notched at summit.. A. glabra
   3. Sepals prominently ribbed, firm, with acute subulate tips; leaves firm or rigid, the midrib prominent to the tip; branches bearing numerous dense fascicles of rigid leaves; petals entire.. A. stricta

Arenària glàbra Michx. Smooth Sandwort.

Meaning of Species Name. Glabrous.

Synonyms. A. groenlandica (Retz.) Spreng. var. glabra (Michx.) Fern. in Fernald (1950) and in Gleason (1952).

Other Names. Mountain Daisy, Mountain Starwort, Mountain Sandwort.

Type of Plant. A delicate annual or possibly perennial.

Habitat. Mostly on dry exposed grassy or rocky ledges of low mts and foothills.

Range. Me, NH, Ct, and RI, the Shawangunks and Catskills of NY, s to NC, SC, Ga, and Tenn.

Distr in NYS. Locally frequent from the Catskill mts and southw.

Distr in the Torrey Range. NY: The higher peaks of the Catskills.

Elevation. 340-4040 ft in the Torrey range.

Time of Fl. May-Sep.

Origin. Native.

Remarks. See also p. 268 in this volume.

Arenària lateriflòra L. Blunt-leaved Sandwort.

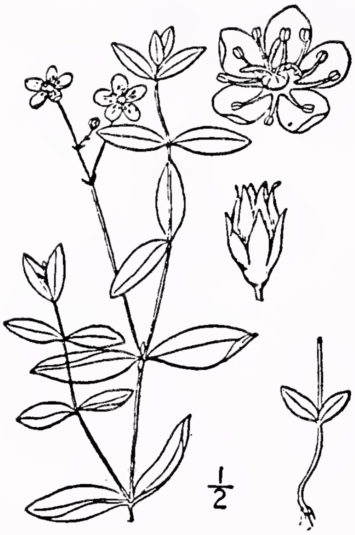
Meaning of Species Name. Flowering on the side.

Other Names. Grove Sandwort, Showy Sandwort.

Type of Plant. A perennial herb.

Habitat. In moist or dryish sandy or stony places along shores, in meadows, marshes, swamps, and borders of woods.

Range. A polymorphic, circumboreal species extending from Lab to Ak, s to Md, O, Ind, Ill, Mo, SD, and NM; also in BC, Ore, n Eu, and Asia.



Arenaria lateriflora--Blunt-leaved Sandwort
[From Britton & Brown (1913), Vol. II, p. 57.]

Distr in NYS. Frequent or common across the state northw, less common southw to LI and SI, and rare or absent in the pine barrens.

Distr in the Torrey Range. Not very common throughout most parts of our range, but rare or wanting in the pine barrens of LI and NJ.

Time of Fl. May-Aug; May 20-Jun at Cornell.

Origin. Native.

Arenària serpyllifòlia L. Thyme-leaved Sandwort.

Meaning of Species Name. With leaves of Serpyllum, Thyme.

Other Names. Sandwort Chickweed, Thyme-sandwort.

Type of Plant. An annual herb, reproducing by seeds.

Habitat. Dry sterile ledges, fields, roadsides, and waste places.

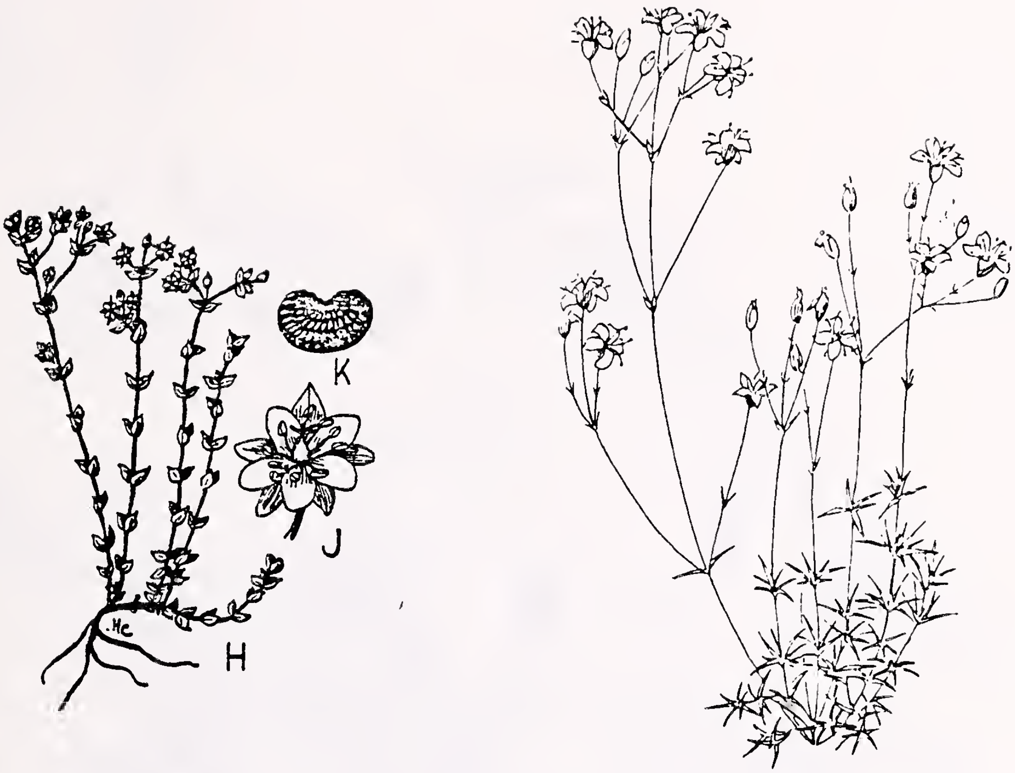
Range. Que to BC, s to Fla, Tenn, Mo, etc., essentially throughout temperate NAm.

Distr in NYS. Frequent or common throughout the cult areas of the state.

Distr in the Torrey Range. Common throughout our range, but usually more plentiful in cult areas than elsewhere.

Time of Fl. (Apr)May-Aug; May-Dec at Cornell.

Origin. Natzd from Eu.

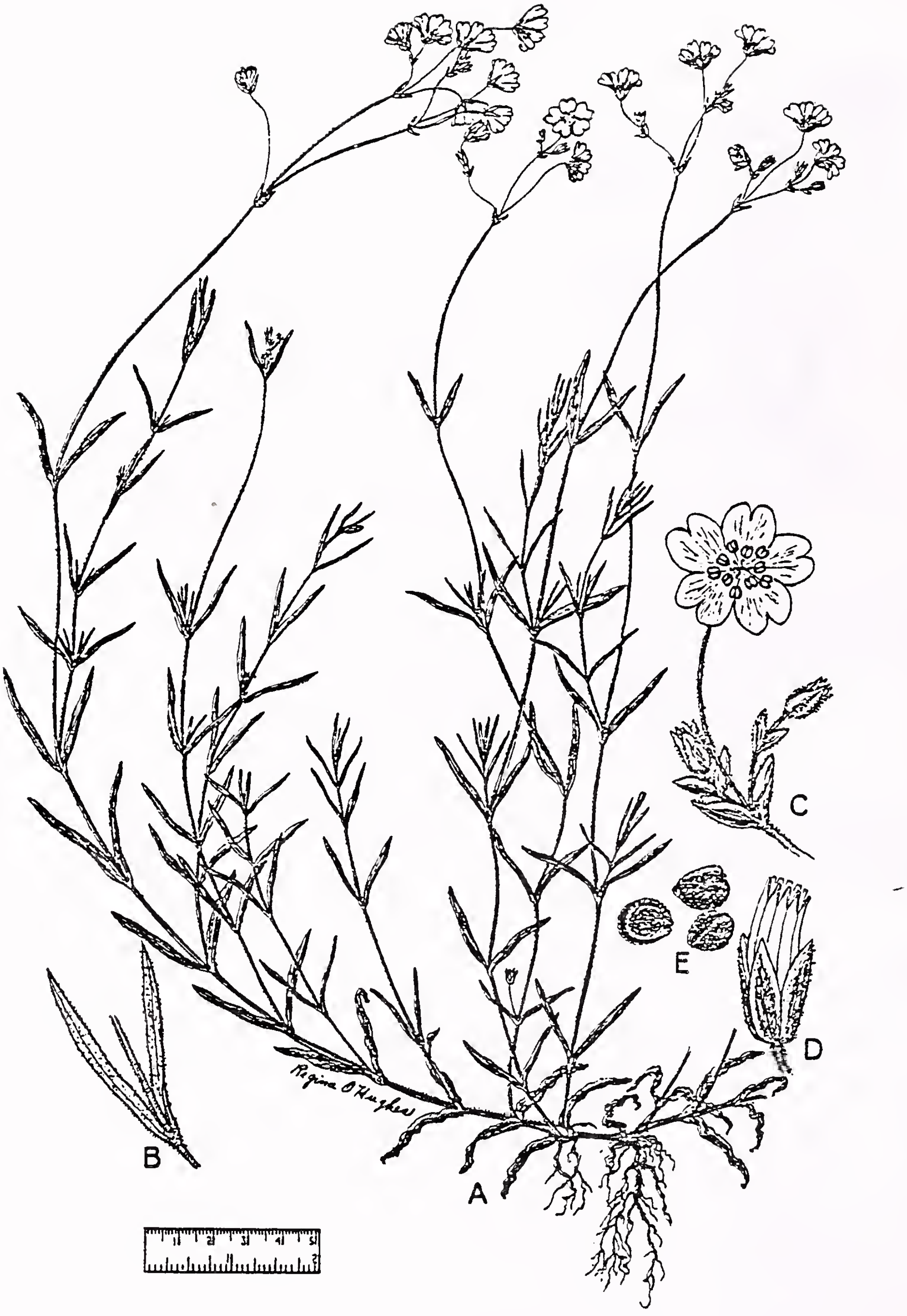


(Left) Arenaria serpyllifolia--Thyme-leaved Sandwort
[From Muenscher (1952), Fig. 35, p. 235.]
(Right) Arenaria stricta--Rock Sandwort
[From Smith (1966), Plate 44, p. 110.]

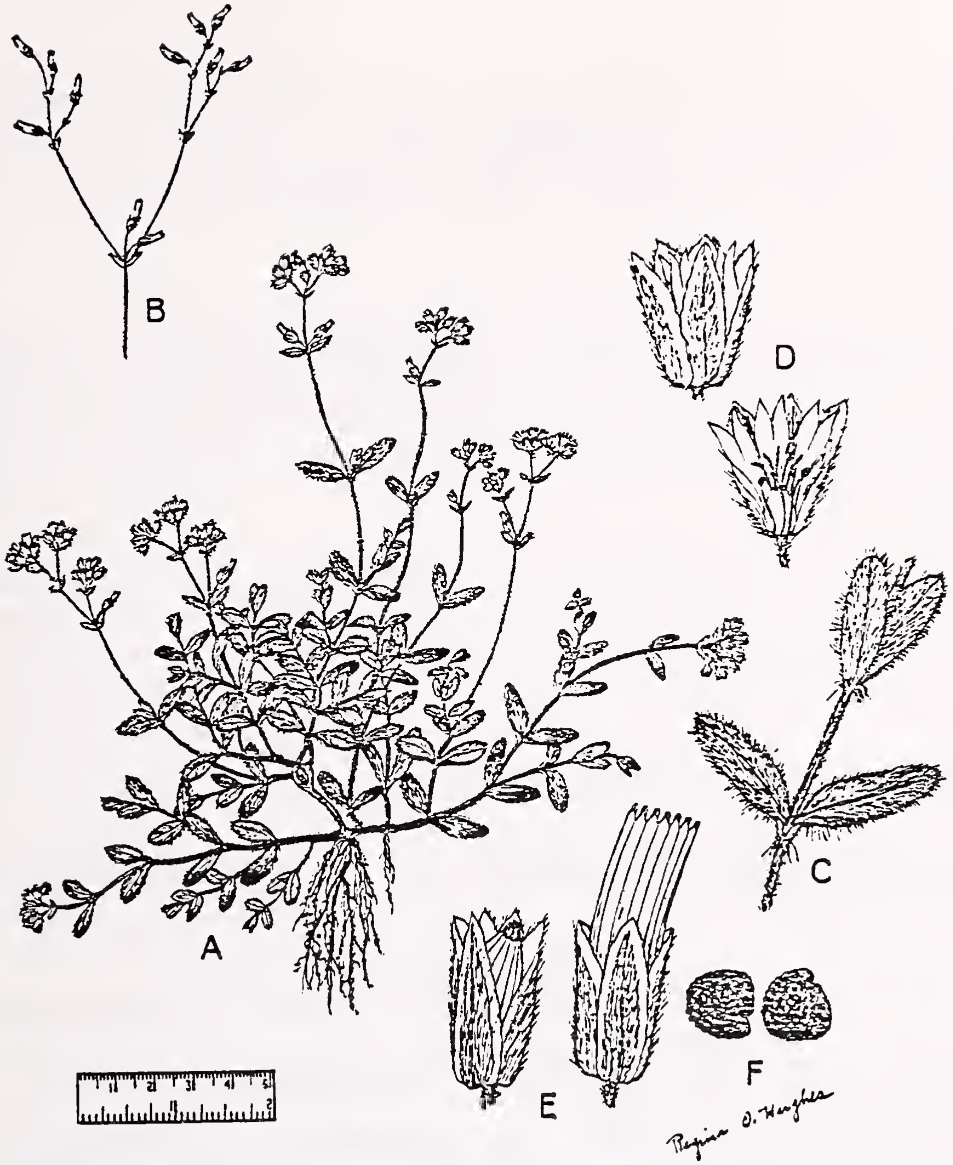
In areas where this species has become a pestiferous weed, Muenscher (1952) suggests that it can be brought under control by the application of fertilizer to stimulate the crop plants, which will then smother out this sandwort.

Cerástium L. Mouse-eared Chickweed.

There are nearly 100 species of *Cerastium*, low-growing, hardy perennials of world-wide distribution and varied habitats, mostly in temperate climates. The name of the genus is derived from the Greek *keras*, horn, or *cerastes*, horned, alluding to the shape of the slender and often curved seed capsule. Some species are useful for planting in the rock garden (though not near choice plants), for edging, and for carpeting beds in the flower garden, but only a few are worthy of cultivation. *C. alpinum* var. *lanatum*, a small tufted plant 2 inches high, bears large white flowers in early summer. *C. tomentosum*, Snow-in-summer, has very white leaves and bears masses of white flowers in early summer. It can be planted on dry banks as a carpeting plant, but it is too rampant to associate with choice plants, which it will quickly smother. Several other species are weeds well known to the gardener.



Cerastium arvense--Field Chickweed
[From USDA Agr. Research Sv. (1971), Fig. 76, p. 157.]



Cerastium vulgatum--Mouse-eared Chickweed
[From USDA Agr. Research Sv. (1971), Fig. 77, p. 159.]

Key to Local Species of Cerastium

1. Petals 8-10 mm long, 2 or 3 times length of sepals; sepals and leaves rather stiff, the leaves with fascicles of leaves in the axils; leaves mostly linear to oblong, not hirsute.......... C. arvense
1. Petals mostly 5-7 mm long, about equaling or only slightly exceeding sepals; sepals and leaves soft, without axillary fascicles; leaves oblong, hirsute.............................. C. vulgatum

Cerástium arvénse L. Field Chickweed.

Meaning of Species Name. Of cultivated ground.
Other Names. Meadow Chickweed.

Type of Plant. A matted perennial herb, reproducing by seeds and creeping stems rooting at the lower nodes.

Habitat. Dry or rocky, gravelly, or sandy areas, often in calcareous or magnesium soils; frequently a weed in abandoned fields, lawns, and meadows.

Range. Gl to Ak, s to Ga, Wis, SD, NM, Ariz, and Cal; also in Eurasia.

Distr in NYS. Locally common across the state; frequent on the hills and mountains of the Hudson valley from L George to Putnam and Ulster co, less common but widely distr westw across the state to the Niagara r, but not reported from the Adirondack reg or the n counties.

Distr in the Torrey Range. NY: In 1915 known only from West Point.

Time of Fl. Apr-Aug; May at Cornell.

Origin. Native.

This weed does not persist in cultivated areas. In lawns raise the creeping stems with a rake and mow close to the ground. Small patches can be dug or hoed out and reseeded or planted with new sod. It can also be sprayed with a weed killer.

Cerástium vulgàtum L. Mouse-eared Chickweed.

Meaning of Species Name. Common.

Other Names. Large Mouse-eared Chickweed, Larger Mouse-eared Chickweed, Mouse-ear.

Type of Plant. A short-lived perennial herb, reproducing by seeds and occasionally by root development on creeping stems.

Habitat. Widely natzd in lawns, fields, pastures, woods, roadsides, cult land, and waste places.

Range. Almost throughout the US and s Canada.

Distr in NYS. Very common.

Distr in the Torrey Range. Locally abundant as a weed; rare in the pine barrens.

Time of Fl. Apr-Oct, sometimes through the winter; May-Sep at Cornell.

Origin. Natzd from Eu.

Frequently a troublesome weed, especially in lawns, but it can be brought under control by the same methods as those given for C. arvense.

Diánthus L. Pink.

There are more than 300 species of Dianthus, widely distributed in Eurasia but found chiefly in the Mediterranean region; only one species, D. repens, of Alaska, is native to North America. The name of the genus is derived from the Greek Zeus, Dios, Jupiter, and anthos, flower, i.e., Jove's own flower, a name said to have been given to some member of this genus by Theophrastus because of the beauty and fragrance of its flowers. They are herbaceous perennials of low stature, often with very showy flowers, a number of which have long been cultivated as ornamentals, including D. plumarius, the Garden Pink, and D. caryophyllus, the Clove Pink or Carnation, a native of southern Europe. Sweet-william is derived from the Eurasian D.

barbatus, a wild plant of the Mediterranean area. *D. chinensis*, the plant from which the showy varieties of Indian and Chinese Pinks, so popular for summer flower beds, are descended, is a native of China. The alpine pinks, which are grown in the rock garden, are found wild chiefly in the European Alps.

The flower petals of *D. caryophyllus* were at one time much used in medicine. The *U.S. Dispensatory* of 1865 states that "Flowers of the deepest red color and most aromatic odor are selected for medicinal use. Both water and alcohol extract their sensible properties, and they yield a fragrant essential oil by distillation. In Europe they are employed to impart color and flavor to a syrup, which serves as a vehicle for other less pleasant medicines."

Key to Local Species of Dianthus

1. Flowers all or nearly all solitary and long-stalked, 1-many on a stem (a low perennial 1-4 dm tall with trailing leafy shoots forming loose mats; calyx 1.5-2 cm long, the long-tipped basal bracts half as long).. *D. deltoides*
1. Flowers sessile or closely crowded in glomerules or fascicles, 2
   2. A branching annual or biennial, pubescent; flowers few in small clusters at tips of branches.............................. *D. armeria*
   2. A cespitose perennial with simple erect stems, glabrous or merely scabrous; fascicles of flowers crowded into a broad and dense corymbiform cyme............................. *D. barbatus*

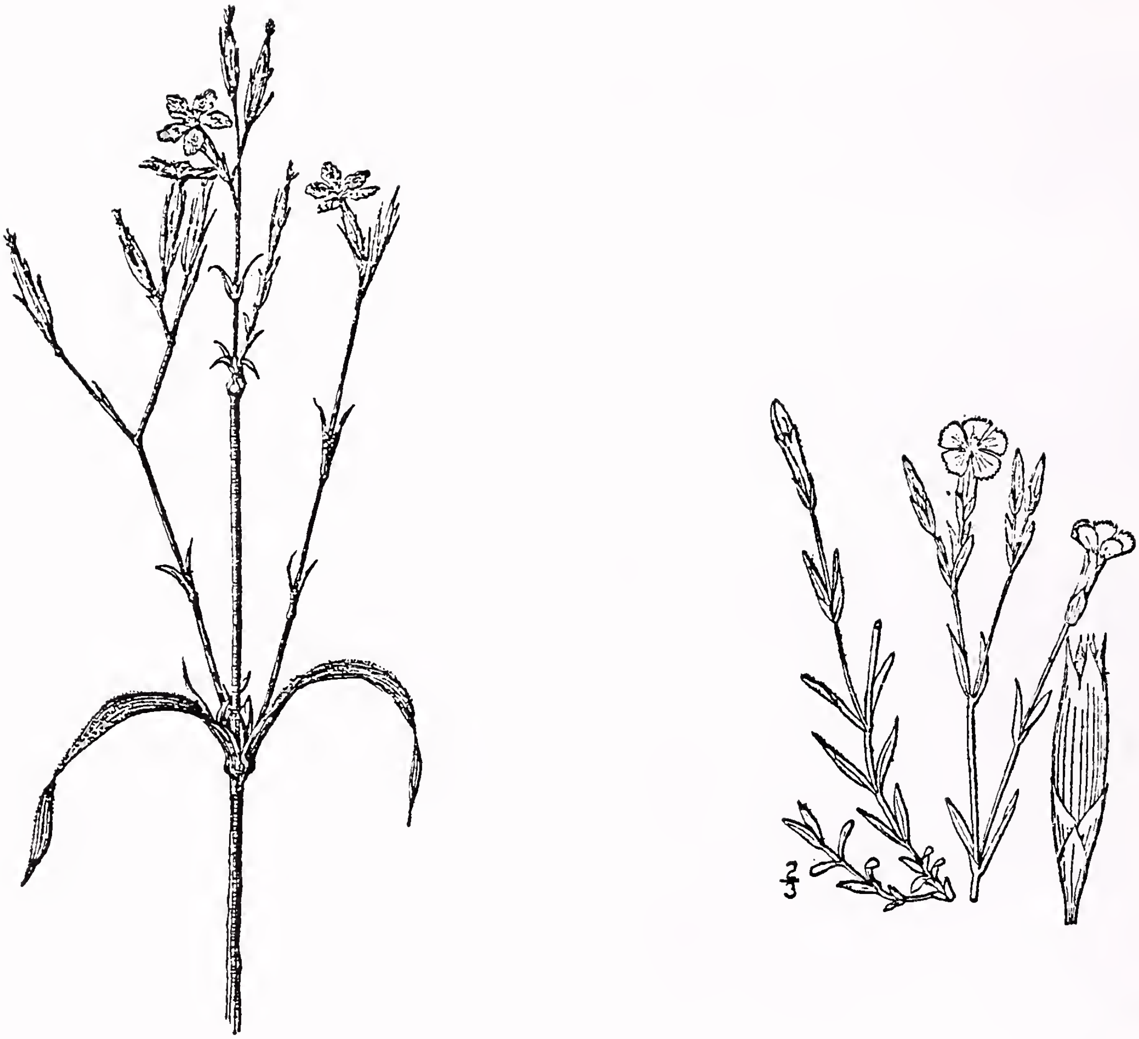
Diánthus armèria L. Deptford Pink.

Meaning of Species Name. Early placed with the genus *Armeria*, Thrift.
Other Names. Grass Pink.
Type of Plant. An annual or winter annual, reproducing by seeds.
Habitat. Dry fields, pastures, roadsides, and waste places.
Range. Que and Ont to BC, s to Ga, Ky, and Mo.
Distr in NYS. Frequent in most secs of the state.
Distr in the Torrey Range. Common or frequent throughout our area as a roadside weed.
Time of Fl. May-Jul; Jun 15-Aug 10 at Cornell.
Origin. Natzd from Eu.

This species is commonly established as a weed in the Catskill area. Clean cultivation will bring it under control. In grasslands hand pulling or early close mowing to prevent seed production will also bring this weed under control.

Diánthus deltoìdes L. Maiden Pink.

Meaning of Species Name. Triangular.
Other Names. Pink, Meadow Pink, Spink.
Type of Plant. A low perennial herb, reproducing by seeds.



(Left) Dianthus armeria--Deptford Pink
[From Creevey (1912), p. 257.]
(Right) Dianthus deltoides--Maiden Pink
[From Britton & Brown (1913), Vol. II, p. 74.]

Habitat. Roadsides, dry fields, old gardens, open woods, and waste places.

Range. NE to NJ, w to Ill and Mich.

Distr in NYS. Infrequent and not reported from the extreme s part of the state.

Distr in the Torrey Range. Rare and local as a field weed in n Ct and in Delaware co, NY; also near Philadelphia.

Time of Fl. Late May-Aug.

Origin. Natzd from Eu.

Remarks. Often cult and locally esc.

Diánthus barbàtus L. Sweet William.

Meaning of Species Name. Bearded.

Type of Plant. A perennial herb.

Habitat. Spread from cult to roadsides, groves, waste places, and the like.

Range. Que to ND, s to NE, Del, etc.

Distr in NYS. Occasional or locally common in waste places, usually as an esc from gardens.

Distr in the Torrey Range. Rather rare as an occasional esc from gardens in most parts of our range.

Time of Fl. Jun-Aug.

Origin. Introd from Eu.

Lýchnis L. Campion.

There are about 40 species of Lychnis, annuals or hardy perennials chiefly confined to boreal or montane regions of the northern hemisphere, represented also by a few indigenous species in South America. The name of the genus is derived from the Greek lychnos, a lamp or flame, referring to the brilliant flowers, a name given to a Mediterranean species by Theophrastus. Many are handsome garden plants long cultivated as ornamentals, among which is L. chalcedonia, the Maltese or Jerusalem Cross. L. coronaria, the Mullein Pink, a species from southern Europe, is another handsome perennial plant for the flower border. It frequently escapes from cultivation and has become established in many places. L. dioica, the Red Campion or Morning Campion, a native of Europe and Asia, is a charming plant for growing in half-shady positions. It has deep rose-colored flowers during a long summer season. L. alpina, the Arctic Catchfly, is a useful plant for the rock garden.

Key to the Catskill Species of Lychnis

1. Some or all flowers dioecious, with fruiting calyx much inflated; valves of capsule distinctly 2-toothed; flowers white, opening in the evening; a loosely branching leafy biennial or short-lived perennial.. L. alba
1. Flowers perfect or mostly so; calyx scarcely inflated; valves of capsule entire or barely notched; flowers pink, roseate, or scarlet; perennials with simple or sparsely branched stems, 2
   2. Stem loosely long-villous; leaves ovate, cordate, very numerous; inflorescence hemispherical, dense; corolla scarlet; petals bifid.. L. chalcedonia
   2. Stem glabrous or merely viscid-pilose; leaves remote, narrowly lanceolate; inflorescence open-paniculate; corolla pink or roseate; petals deeply 4-cleft.............. L. flos-cuculi

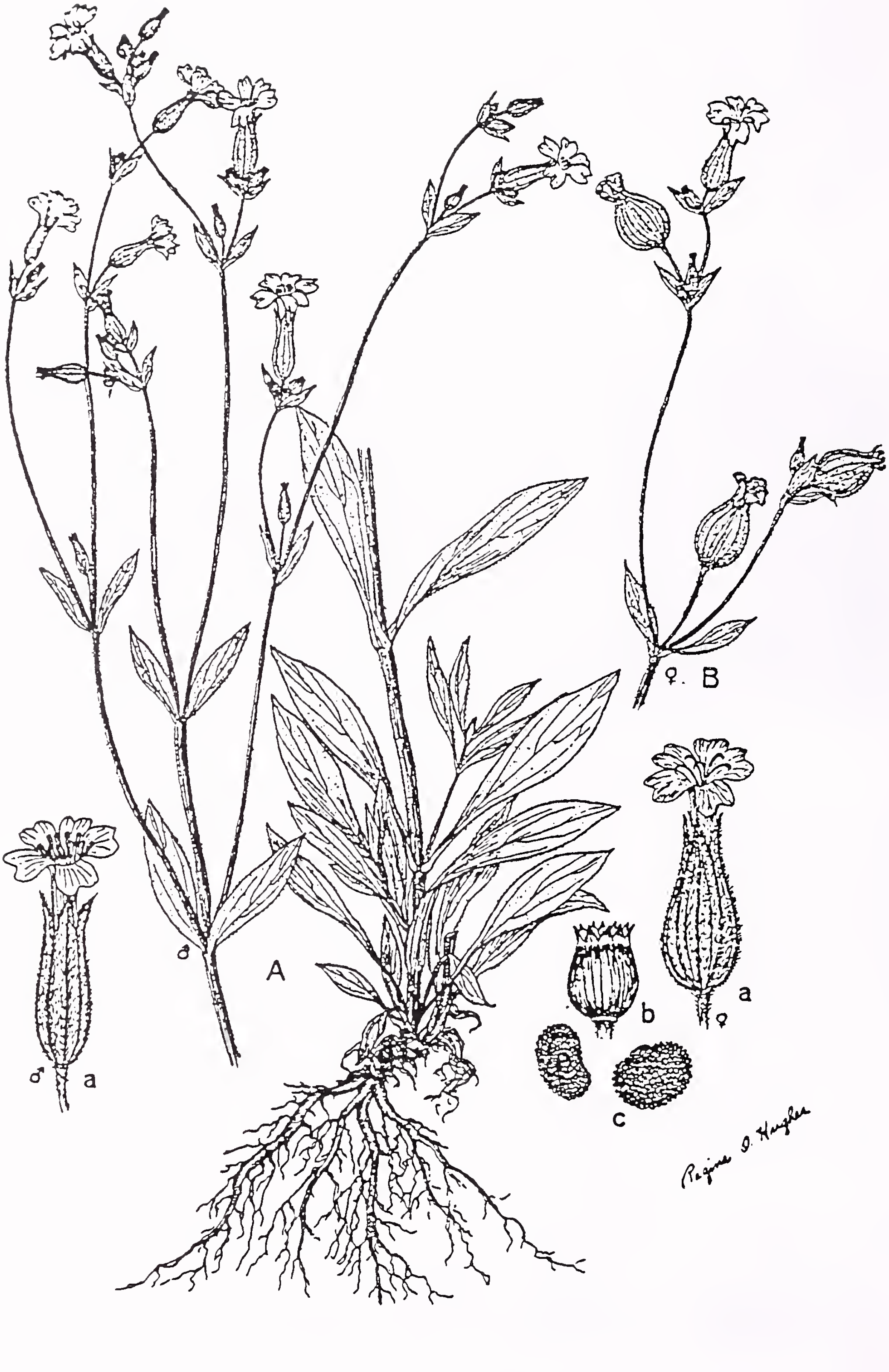
Lýchnis álba Mill. White Campion.

Meaning of Species Name. White.

Other Names. Evening Lychnis, White Cockle, Snake Cockoo, Thunderflower, Bull Rattle, White Robin, Snake-flower, Cockoo-flower, Cowrattle.

Type of Plant. A dioecious biennial or short-lived perennial herb, reproducing by seeds and short rootstocks.

Habitat. Roadsides, borders of fields, grasslands, and waste places.



Lychnis alba--White Campion
[From USDA Agr. Research Sv. (1971), Fig. 78, p. 161.]

Range. NS and Que to BC, s to NC, Ga, O, Ind, Ill, Mo, Kan, Col, Utah, and Cal.

Distr in NYS. In 1924 reported by House to be "Infrequent and local."

Distr in the Torrey Range. Not very common as a weed in most parts of our range; rare or wanting in the pine barrens.

Time of Fl. Late May-Sep; Jun-Jul at Cornell.

Origin. Natzd from Eurasia.

Remarks. Now a common weed throughout the Catskill reg.

One authority describes this species as another beautiful European native plant that has become naturalized in the eastern United States and suggests that it is well worth cultivating in the wilder parts of the garden for its deliciously fragrant white flowers. There is a handsome variety with double flowers.

In areas where this species has become an undesirable weed (often introduced with impure clover and alfalfa seed), Muenscher (1952) suggests plowing badly infested fields and following with a clean cultivated crop in a short rotation. Scattered plants should be pulled or hoed off early to prevent seed production. This common weed is often confused with Silene noctiflora; the two plants are distinguished as follows:

1. Styles 5; flowers mostly unisexual, bearing either stamens or pistils (rarely both), each on different plants; plants biennial with coarsely hairy stems; calyx lobes triangular-lanceolate, acute, 3-5 mm long; teeth of capsule 10, each of the 5 main teeth split in two.................................... Lychnis alba
1. Styles 3; flowers perfect, each bearing stamens and pistils; plants annual with short stem hairs; calyx lobes linear-lanceolate, slenderly pointed, 4-8 mm long; teeth of capsule 6... Silene noctiflora

Lýchnis chalcedònia L. Maltese Cross.

Meaning of Species Name. Of Chalcedon on the Bosporus.

Other Names. Scarlet Lychnis, London Pride, Fire-balls, Sweet-William, None-such, Scarlet-lightning, Cross-of-Jerusalem, Knight's-cross, Jerusalem Cross.

Type of Plant. A perennial herb.

Habitat. Thickets, open woods, fields, and roadsides.

Range. PEI to s NE, w to Minn.

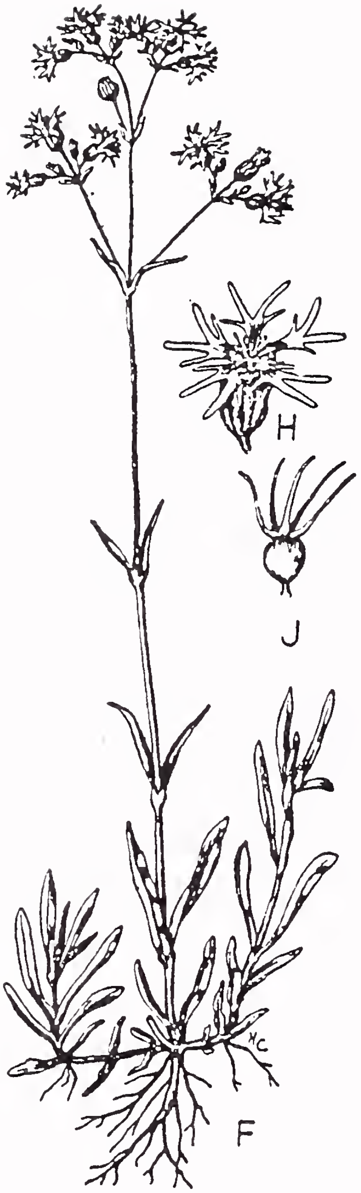
Distr in NYS. A rare esc.

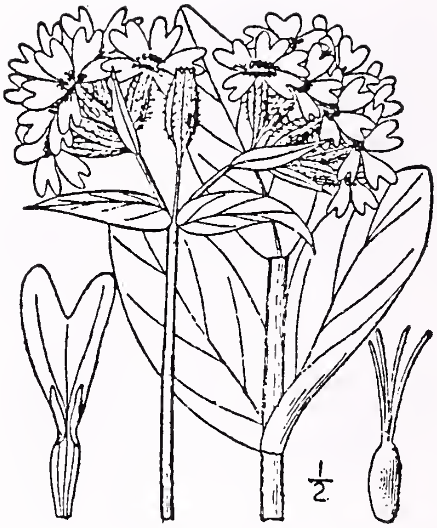
Distr in the Torrey Range. A rather rare esc on LI and SI, the lower Hudson valley, and in Ct.

Time of Fl. Jun-Aug(Sep); Jun-Sep at Cornell.

Origin. Introd from Asia.

This native of Russia, a handsome hardy perennial, has long been a popular plant for the flower border, as it is both showy and easily grown. It has escaped from cultivation and is occasionally spontaneous in the northeastern states and probably elsewhere. This species has not been collected in the Catskills since 1897, presumably as an escape from





(Left) Lychnis flos-cuculi--Ragged Robin
[From Muenscher (1952), Fig. 33, p. 228.]
(Right). Lychnis chalcedonia--Maltese Cross
[From Britton & Brown (1913), Vol. II, p. 69.]

cultivation. Although Domville and Dunbar (1970) list it as "Occasionally spread from cultivation," it can scarcely be considered an integral part of the Catskill flora. Continued search may well result in additional records for this species in the Catskill region.

Lýchnis flòs-cùculi L. Ragged Robin.

Meaning of Species Name. Cuckoo-flower.
Other Names. Cockoo-flower, Meadow-pink, Meadow-campion, Cockoos, Crow-flower, Indian-pink, Ragged Jade, Ragged Jack, Marsh Gilliflower.

Type of Plant. A perennial herb, reproducing by seeds and short rootstocks.

Habitat. Rich moist soil of fields, meadows, pastures, swales, and roadsides.

Range. Que to NY, s to NE and Pa, and probably elsewhere.

Distr in NYS. Locally common across the state.

Distr in the Torrey Range. Not uncommon near the larger cities as an esc from cult, rarely persisting.

Time of Fl. (Late May)Jun-Jul(Sep).

Origin. Natzd from Eu.

This native of Europe and northern Asia is a hardy perennial that has become naturalized in eastern North America. A double-flowered variety is well worth growing in the flower border. In areas where it has become an undesirable weed, it can be controlled by the same methods as those outlined for L. alba.

Paronýchia Mill. Whitlow-wort.

There are about 50 species of Paronychia, widely distributed in the temperate regions of both hemispheres; some 20 species are native to North America. They are dwarf, creeping, perennial herbs, for the most part with insignificant flowers clustered in dense or loose cymes or in the forks of the stem. The name of the genus is derived from the Greek para, by, and onyx or onychos, fingernail, for the whitlow or felon, a disease of the finger which one European species was supposed to cure.

Many species form dense mats of evergreen leaves that are attractive at all seasons of the year. The slender stems bear opposite leaves 1/8 inch in length with minute silvery bracts at their bases. The greenish-white flowers, also surrounded by silvery white bracts, grow in tiny clusters along the stems. Some species are very attractive when planted in the rock garden or in the spaces between flagstones forming paths and terraces. The chief kinds in cultivation are P. capitata, P. argentea, and P. argyrocoma.

Key to the Catskill Species of Paronychia

1. Sepals flat and pliant, much shorter than the mature subglobose utricle (seed capsule), their tips not evidently mucronulate; stems glabrous; calyx 1-1.5 mm long...................... P. canadensis
1. Sepals (at least in age) longitudinally ribbed, rarely much exceeded by the slenderly obovoid utricle, usually mucronulate to subulate-tipped; stems puberulent; calyx 2-3 mm long..... P. fastigiata

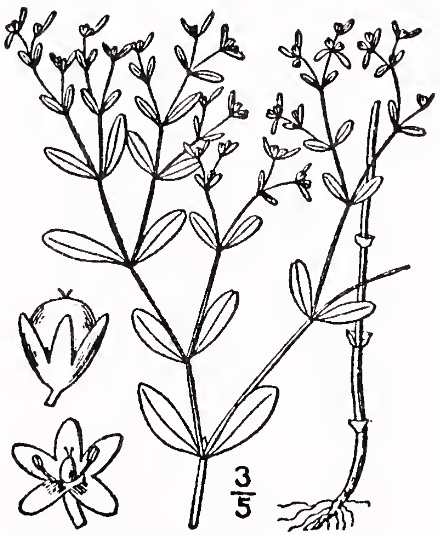
Paronýchia canadénsis (L.) Wood. Slender Forked Chickweed.

Meaning of Species Name. Canadian.

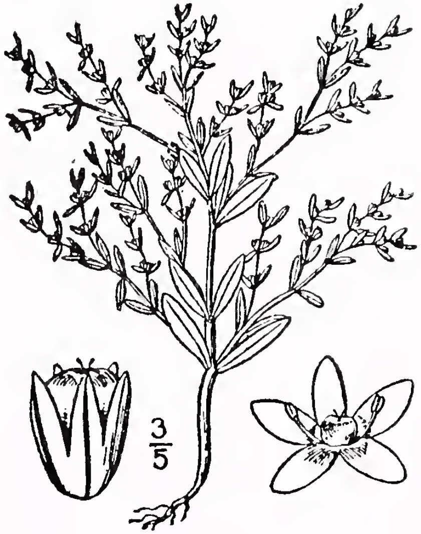
Other Names. Forking Whitlow-wort.

Type of Plant. An annual herb, reproducing by seeds.

Habitat. Thin dry woods, thickets, and rocky or sandy openings, banks, and ledges.



Paronychia canadensis--Slender Forked Chickweed
[From Britton & Brown (1913), Vol. II, p. 30.]



Paronychia fastigiata--Forked Chickweed
[From Britton & Brown (1913), Vol. II, p. 29.]

Range. NH to Minn, s to Va, Ga. Ala, Mo, Ark, and Kan.

Distr in NYS. Under Anychia dichotoma Michx.: Frequent across the state n of the coastal plain and s of the Adirondacks.

Distr in the Torrey Range. NY: In 1915 known only from the n side of LI and on SI.

Time of Fl. Late Jun-Sep(Oct); July at Cornell.

Origin. Native.

Paronychia fastigiata (Raf.) Fern. Forked Chickweed.

Meaning of Species Name. With crowded erect branches.

Type of Plant. An annual herb, reproducing by seeds.

Habitat. Dry woods, thickets, and rocky and sandy openings.

Range. Mass to Minn, s to Fla and Tex.

Distr in NYS. Frequent or local on the n side of LI, on SI, and in Bronx and Westchester co.

Distr in the Torrey Range. Common throughout the range except in the pine barrens of NJ and LI, there rare and local or wanting.

Time of Fl. Jul-Sep.

Origin. Native.

Sagina L. Pearlwort.

There are about 15 species of Sagina, small, hardy herbaceous creeping plants chiefly of the north temperate zone of North America, Europe, and Asia. A few species are found growing wild in the arctic regions. They have filiform or subulate leaves, no stipules, and small flowers terminating the stems or branches in spring and summer. The name of the genus is derived from the Latin sagina, fattening, previously applied to Spergula, which is still planted in Europe as early forage.

They are mostly weeds, especially in lawns on light, sandy soil, but a few are used for various purposes in the garden, such as planting in the crevices between random paving, draping rockery ledges, and for carpet-bedding designs. These species have slender, creeping stems that bear tiny, narrow, bright green, mosslike leaves and small white flowers in summer. S. glabra, which forms a dense carpet of greenery starred with miniature white flowers in summer, and its variety aurea, which has golden-yellow leaves, are used for decorating the rockery or for planting in the crevices of stone pavings. A sunny position is required. S. subulata, a native of Corsica, is also sometimes used. S. procumbens is the species usually found as a weed on lawns.

Sagina procumbens L. Bird's-eye Pearlwort.

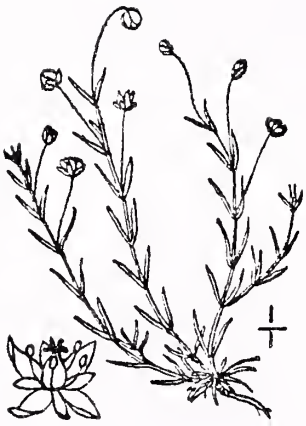
Meaning of Species Name. Lying on the ground.

Other Names. Procumbent Pearlwort, Breakstone, Poverty.

Type of Plant. A matted perennial herb.

Habitat. Moist open soil of shores, waste places, and rocky areas, often a weed in paths and pavements.

Range. Boreal Am and Eurasia, s to Del, Md, WVa, O, Mich, and Minn; also BC, Wash, Ore, and Cal.



Sagina procumbens--Bird's-eye Pearlwort
[From Britton & Brown (1913), Vol. II, p. 51.]

Distr in NYS. Rare or occasional along the coastal reg; reported inland from near Troy, streets of Utica, and other localities.
Distr in the Torrey Range. Rare or occasional throughout most parts of our range except in the pine barrens, there probably wanting.
Time of Fl. (Apr)May-Sep(Nov); May 25-Jun 20 at Cornell.
Origin. Native.

Saponària L. Soapwort.

This is a Eurasian genus of about 50 species of free-flowering, coarse, hardy annual or perennial plants. The name of the genus is derived from the Latin *sapo*, soap, alluding to the mucilaginous juice which forms a lather with water. The plants are rather diverse in habit; some species have stout upright stems, others creep along the ground or trail over rocks and are of tufted growth.

Some species are of ornamental value. *S. calabrica*, deep rose, and its variety Scarlet Queen, scarlet, are ideal carpeting or bedding plants. These free-flowering annual or biennial plants grow 6 inches in height, are of tufted habit, and produce their small, star-shaped flowers in great profusion. The Rock Soapwort, *S. ocymoides*, a hardy perennial, is a charming rock-garden plant that also grows well on a dry wall. It flowers so profusely that the small ovate-lanceolate leaves are often hidden.

Key to Local Species of Saponaria

1. Calyx tubular, 20-nerved; perennial..................... *S. officinalis*
1. Calyx ovoid, 5-ribbed, strongly wing-angled; annual........ *S. vaccaria*

Saponària officinàlis L. Soapwort.

Meaning of Species Name. Of the shops.
Other Names. Bouncing-bet, Fuller's-herb, Scourwort, Old-maid's Pink, London Pride, Hedge-pink, Wild Sweet William, Sweet Betty, Boston

Pink, Chimney Pink, Sheepweed, Soap-root, Crow-soap, Soapwort-gentian, World's-wonder, Lady-by (or -at)-the-gate, Wood Phlox, Mock Gilliflower.

Type of Plant. A stout perennial, reproducing by seeds and short rootstocks.

Habitat. Railway embankments, roadsides, neglected fields, and waste places.

Range. Throughout most of temperate NAm.

Distr in NYS. Common.

Distr in the Torrey Range. Locally abundant as a weed.

Time of Fl. Jul-Sep; Jul-Sep at Cornell.

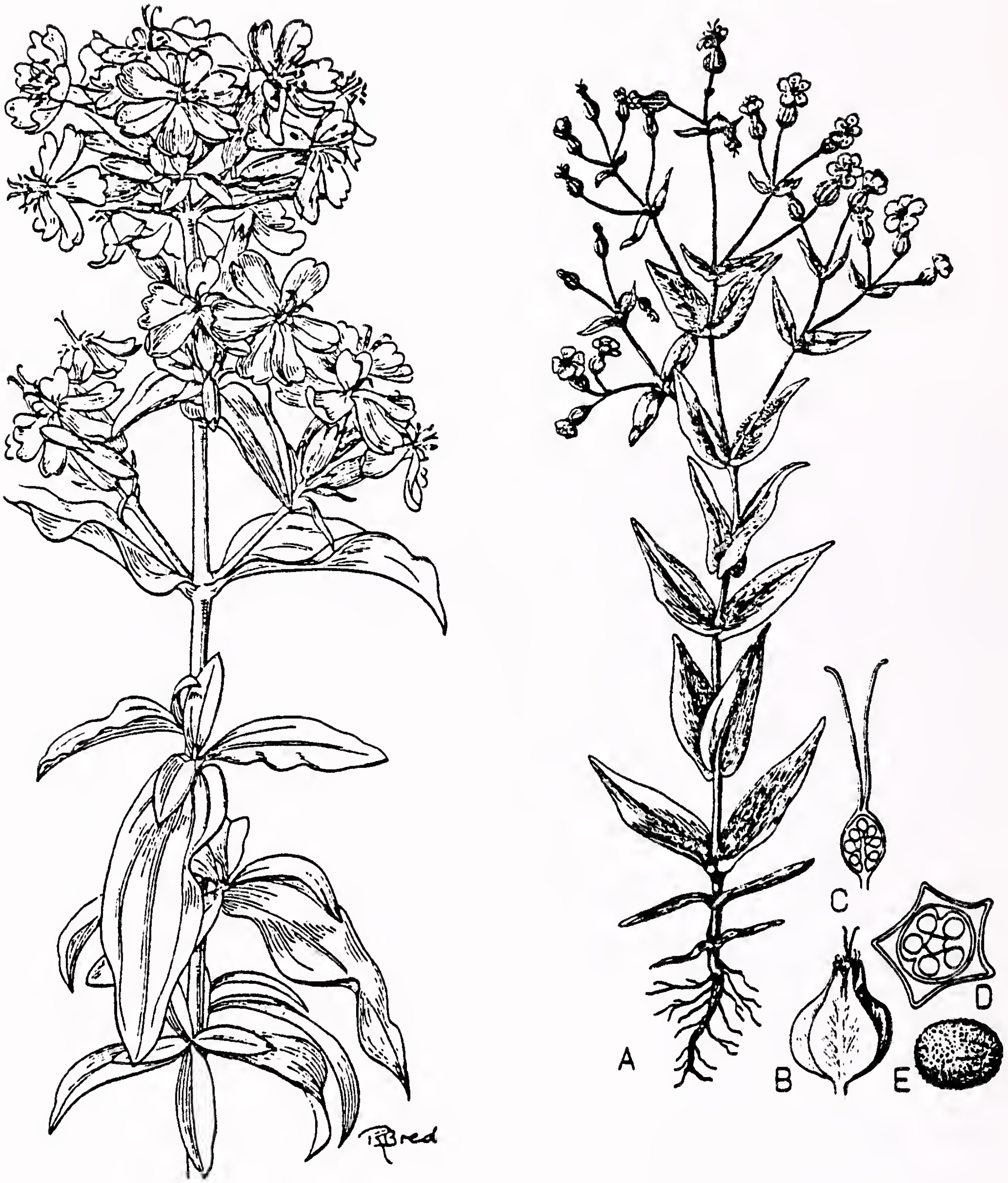
Origin. Natzd from Eu.

Remarks. Formerly cult.

This perennial herb is a native of western Asia, but it also occurs in Europe, principally on waste ground near habitations, where it is probably an escape from cultivation. Its common name refers to the fact that the roots and bruised leaves produce a lather like soap when stirred in warm water. Other genera of this family also exhibit this property, including some species of Silene, Dianthus, and Lychnis. This fact made it a useful plant in medieval Europe, when fat for making soap was sometimes rather scarce, for there is little doubt that mendicant monks, among others of that period, used the leaves as a substitute for soap in washing their clothes. Johnson (1867) remarks that "The leaves when boiled or bruised in water ... were used in ancient times as a substitute for soap ... The lather so formed has all the effects of soap, and readily removes grease; not being affected by acids, it might be usefully applied where the water is very hard." One modern authority suggests that it can still be useful for washing delicate fabrics. It has also been reported that at one time the juice of this plant was frequently added to beer to help make a froth.

Soapwort may well have been brought from Europe to this country as an ornamental; it is still planted in the perennial border, for it is a rather attractive plant bearing flowers suitable for cutting, particularly the double-flowered variety, a late summer-flowering plant suitable for a semishaded perennial border or in front of shrubs. Its pink flowers, lasting for many weeks, are showy, but care must be taken to keep it confined, for it spreads rapidly by means of underground rhizomes.

At one time both the root, collected in the fall, and the leaves of this species were employed in medicine as a tonic, diaphoretic, and alterative, considered a valuable remedy for rheumatism and cutaneous troubles resulting from any form of syphilis. The medical virtues of this plant reside in a principle obtained from the root called saponin, obtained by treating the watery extract with alcohol and evaporating. The 1865 edition of the U.S. Dispensatory gives the following account: "Soapwort, which contains saponin, has been used in Germany as a remedy in venereal and scrofulous affections, cutaneous eruptions, and visceral obstructions. It appears to act as an alterative, like Sarsaparilla, to which it has been deemed superior in efficacy by some physicians. The plant is given in the form of decoction and extract. The inspissated juice, given in the quantity of half an ounce in the course of a day, is said to cure gonorrhea in about two weeks, without any other remedy, but this and other plants containing saponin are capable of producing poisonous effects." A decoction of the leaves was applied externally for skin diseases, particularly "the



(Left) Saponaria officinalis--Soapwort
[From Smith (1966), Plate 47, p. 115.]
(Right) Saponaria vaccaria--Cowherb
[From Muenscher (1935), Fig. 32, p. 225.]

itch"; taken internally, it was considered useful also in the treatment of jaundice, gout, and rheumatism.

Kingsbury (1964) reports that the whole plant, and especially the seeds, contains relatively large amounts of the glucoside saponin; for this reason this plant has a generally accepted reputation for potential toxicity to farm animals. They find it distasteful, however, and no clear cases of poisoning have been recorded in North America. Feeding experiments, on the other hand, have clearly demonstrated that the plant will kill sheep when consumed in an amount equal to 3 percent of the animal's weight.

Where this species has become an undesirable weed, Muenscher (1952) suggests that small areas are best controlled by hand digging or spraying with a weed killer. Large areas should be mowed close to the ground when the first flowers open, both to weaken the plant and to prevent seed formation.

Saponària vaccària L. Cowherb.

Meaning of Species Name. An old generic name, from vacca, cow.
Synonyms. Vaccaria segetalis (Neck.) Garcke in Gleason (1952).
Other Names. Cow-cockle, Spring Cockle, Pink Cockle, Cow-basil.
Type of Plant. A glabrous annual, reproducing by seeds.
Habitat. Waste places, grain fields, occasionally in alfalfa and clover seedings.
Range. Widely distrib as a weed throughout temperate NAm as far n as Ak.
Distr in NYS. Infrequent or locally abundant, especially about cities and towns.
Distr in the Torrey Range. Locally common as a weed.
Time of Fl. Jun-Sep; Jul at Cornell.
Origin. Adv from Eu.
Remarks. Frequently a weed in grainfields.

This species has a generally accepted reputation for potential toxicity to farm animals. Screenings of grain crops may contain large quantities of its seeds, which have poisonous properties similar to those of Corn Cockle. The plant is distasteful to animals, however, and no clear cases of poisoning have been recorded in North America, but Chestnut and Wilcox produced definite signs of toxicity and death in rabbits with extracts from the seeds of this plant.

In areas where this species has become an obnoxious weed, Muenscher (1952) states that it can be controlled by harrowing grainfields to destroy seedlings; scattered plants should be pulled by hand. It is also wise to practice a short rotation with cultivated crops in which wheat is not grown oftener than once in three years. Heavy infestation of grainfields can be avoided by sowing clean wheat seed.

Sclerànthus L. Knawel.

This is a Eurasian genus of about 10 species. They are insignificant little weeds with subulate leaves, obscure greenish clustered flowers, and no stipules. The name of the genus is derived from the Greek scleros, hard, and anthos, flower, referring to the hardened calyx tube.

Sclerànthus ánnuus L. Knawel.

Meaning of Species Name. Annual.

Other Names. German Knot-grass, Gravel Chickweed, Parsley-piert.

Type of Plant. An annual or winter annual, reproducing by seeds.

Habitat. Gardens, lawns, fields, roadsides, and waste places, often in towns and cities.

Range. Que to Minn, s to Fla and Miss; also on the Pacific coast.

Distr in NYS. Locally abundant as a weed.

Distr in the Torrey Range. Locally abundant as a weed but often lacking.

Time of Fl. Mar-Oct; May-Sep at Cornell.

Origin. Native of Eurasia; natzd from Eu.

Remarks. In areas where this species has become an obnoxious weed, it can be controlled by early and clean cultivation to prevent seed formation.

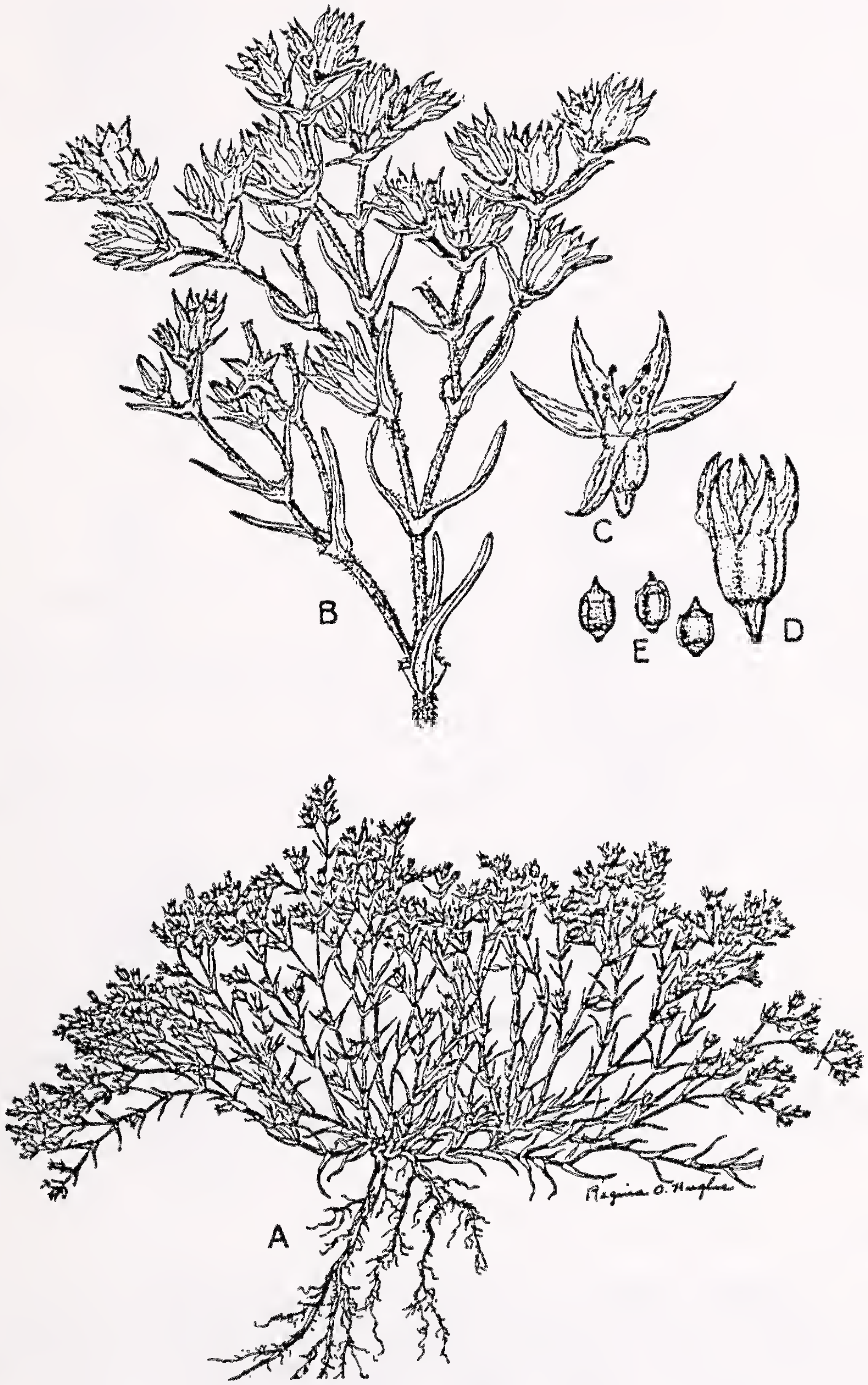
Silène L. Catchfly.

There are about 500 species of Silene, an extensive group of hardy annual, biennial, and perennial herbaceous plants chiefly of boreal or montane habitats in the northern hemisphere but most numerous in Eurasia. The most recent revision of the North American species recognizes 54 species in North America. The name of the genus was adopted by Linnaeus from earlier authors; it is said to have come from mythological Silenus, referring to the viscid excretions of many species, the intoxicated foster-father of Bacchus being described as covered with foam. Small flies are often entrapped in the sticky fluid on the stems and leaves, hence the name Catchfly, one of its common names.

This genus is well represented by numerous attractive species in horticulture, but as the cultivated kinds do not usually exceed 12 inches in height, they are principally used in the rock garden. S. alpestris, the Alpine Catchfly, a native of Europe, is a pretty white-flowered perennial of easy culture growing about 6 inches tall and blooming freely in spring and summer. S. acaulis, the Cushion Pink or Moss-campion, is a dwarf plant of tufted habit native to the high mountains of North America and Europe. It is not difficult to grow, but in cultivation it rarely flowers well away from its mountain home. S. caroliniana (S. pennsylvanica), the Wild Pink, is native to eastern North America. It is a plant for partial shade, bearing clear, deep pink flowers in profusion in spring. S. virginica, the Fire Pink, also a native of the eastern United States, bears large crimson-scarlet blooms in spring and summer. S. virginica was considered poisonous by some tribes of Indians, but, in his Collections, Dr. Barton states that a decoction of the roots is said to be efficacious as an anthelmintic. S. caroliniana probably possesses similar properties.

Key to the Catskill Species of Silene

1. Calyx pilose (inflorescence an open cymose panicle; coarse weedy annual or biennial, viscid-villous; fruiting calyx inflated-ovoid, 1.5-2.3 cm long with prominent green ribs).............. S. noctiflora
1. Calyx glabrous or only minutely puberulent at base, 2



Scleranthus annuus--Knawel
[From USDA Agr. Research Sv. (1971), Fig. 79, p. 163.]

2. Calyx in fruit 2 cm long, conspicuously inflated, the 20 nerves not prominent, connected their entire length by anastomosing veinlets; petals white or pale pink, 2-lobed; a glaucous perennial.. *S. cucubalus*
2. Calyx 4-10 mm long, tight over the capsule, the 5-10 prominent straight ribs not evidently anastomosing; annual or biennial, 3
   3. Stems usually with conspicuous internodal glutinous zones; flowers loosely panicled, on filiform pedicels; fruiting calyx 4-10 mm long, ovoid; petals transient or wanting, rarely conspicuous; capsules subsessile within calyx........... *S. antirrhina*
   3. Stems without internodal glutinous zones; flowers in close terminal corymbiform cymes, short-stalked; fruiting calyx 13-17 mm long, clavate; petals showy, pink or roseate (rarely white), of long duration; capsules long-stipitate... *S. armeria*

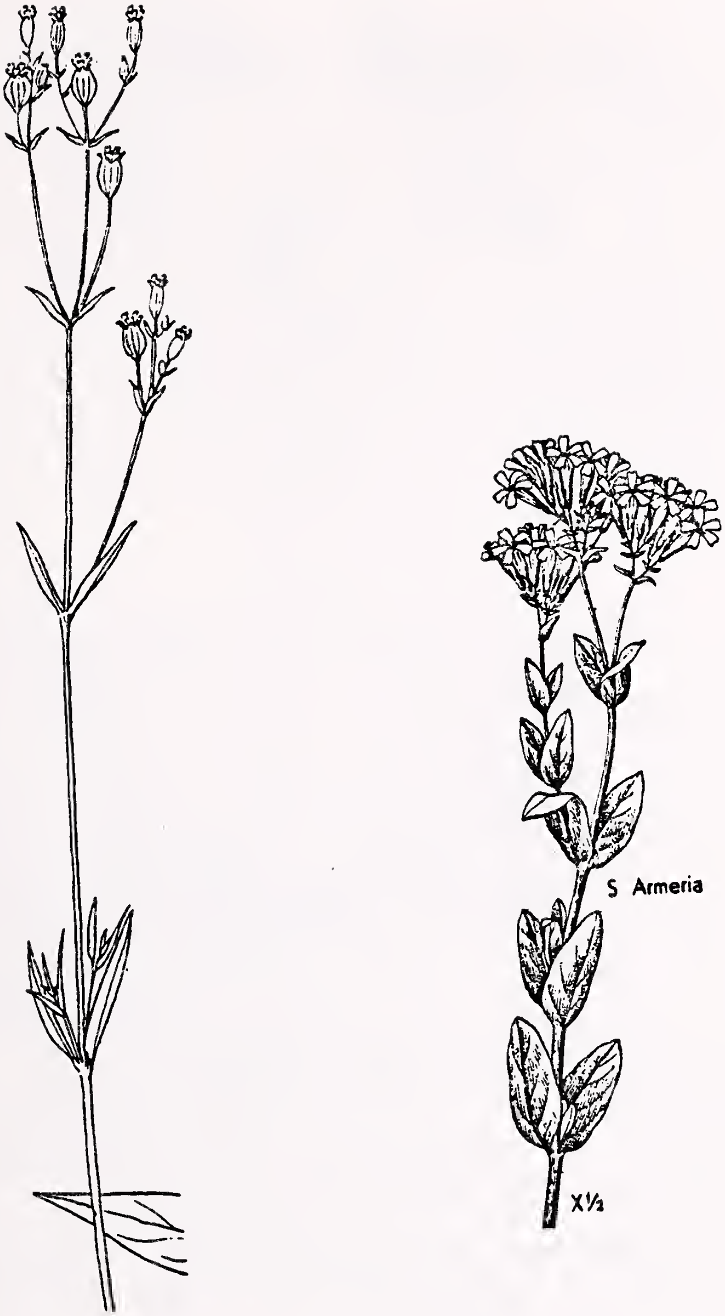
Silène antirrhìna L. Sleepy Catchfly.

Meaning of Species Name. With leaves as in *Antirrhinum*.
Other Names. Tarry Cockle.
Type of Plant. An annual or biennial herb, reproducing by seeds.
Habitat. Dry or rocky open woods, sandy or gravelly soil of meadows, fields, and waste places, and recently cleared or cult soil.
Range. Throughout the US and s Canada.
Distr in NYS. Frequent or common in most secs of the state.
Distr in the Torrey Range. Common as a weed throughout the range except in the pine barrens.
Elevation. Grows to 3200 ft in Va.
Time of Fl. May-Sep; May 15-Jun at Cornell.
Origin. Mex and SAm; adv also in Eu.

This species is by no means abundant in the Catskill region. In areas where it has become a troublesome weed, however, Muenscher (1952) suggests that badly infested meadows should be mowed early before seeds are formed, followed by fall plowing and planting a clean cultivated crop the following year; scattered plants can be pulled or hoed by hand, while grainfields should be harrowed.

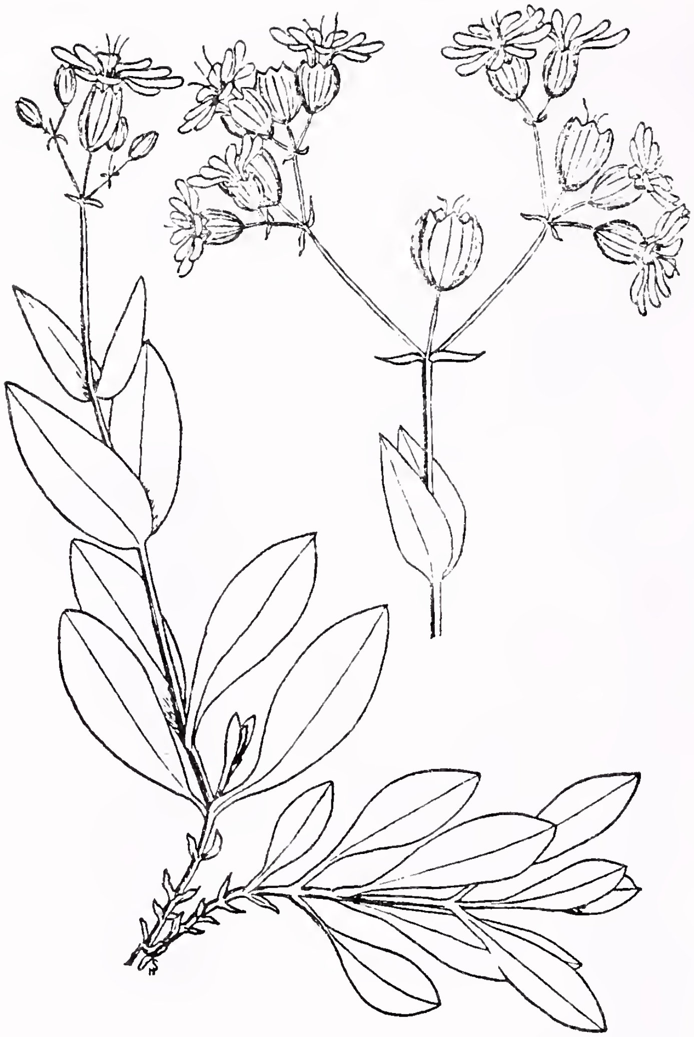
Silène armèria L. Garden Catchfly.

Meaning of Species Name. Early confused with *Armeria*, Thrift.
Other Names. Sweet-William Catchfly, Sweet William, None-so-pretty, Sweet-susan, Pretty-Nancy, Old-maid's-pink, Mice Pink, Dwarf French-pinks, Wax-plant, Mock Sweet-william, Limewort Catchfly, Lobel's Catchfly.
Type of Plant. A glaucous annual herb.
Habitat. Roadsides and waste places.
Range. Que to Minn, s to Va, O, Ind, Ill, and Ia.
Distr in NYS. Not common.
Distr in the Torrey Range. A rather uncommon esc and occurring as a weed in most parts of the range.
Elevation. Collected at 1500 ft in Ulster co.



(Left) Silene antirrhina--Sleepy Catchfly
[From Smith (1966), Plate 46, p. 114.]
(Right) Silene armeria--Garden Catchfly
[From Gleason (1952), Vol. II, p. 139.]

Time of Fl. Jun.
Origin. Introd from Eu.
Remarks. Once popular in cult; frequently esc and estab as a weed.



Silene cucubalus--Bladder-campion
[From Fernald & Kinsey (1943), Fig. 57, p. 194.]

Silène cucubàlus Wibel. Bladder-campion.

Meaning of Species Name. An old generic name.

Other Names. Maiden's-tears, Behen, White Ben, Cow-bell, Spattling Poppy, Bull-rattle, Rattle-bags, Devil's Rattle-box, Snappers, Knap-bottle, Bird's-eggs, Sea-pink.

Type of Plant. A robust, glaucous perennial herb, reproducing by seeds.

Habitat. Roadsides, borders of fields, meadows, waste places, and gravelly shores, often in open woods.

Range. Nf to BC, s to Va, Tenn, Mo, Kan, Col, and Ore.

Distr in NYS. Frequent or locally common across the state, especially in the more thickly settled secs; reported from SI in 1860 and from Buffalo in 1866.

Distr in the Torrey Range. Under S. latifolia: Not very common along roadsides in most parts of the range; unknown in the pine barrens.

Time of Fl. Apr-Aug; Jun-Aug at Cornell.

Origin. Natzd from Eurasia.

The Bladder-campion, so named from its inflated, thin-textured calices, is one of our commonest roadside weeds. The young shoots, when about 2 inches long, are a palatable cooked green, having a flavor suggestive of green peas but with a slight bitter taste; it can also be used as the basis for a thick soup. This taste is due to saponin, a bitter principle present in many members of the Pink family and poisonous in large quantity. The amount present in the young shoots of Bladder-campion is not harmful, and some English authors have suggested the cultivation of the plant as a garden vegetable, the bitter principle in the new shoots being checked by blanching with mulch. A puree made from the boiled shoots is nearly equal to the best purée of Spinach, according to one authority. It is reported that in 1685 the crops in Monorca having been nearly destroyed by locusts, this plant afforded support to many of the inhabitants. Pickering reported in 1879 that this species was used throughout the Levant, the leaves being cooked and eaten.

Silène noctiflòra L. Night-flowering Catchfly.

Meaning of Species Name. Flowering at night.
Other Names. Sticky Cockle.
Type of Plant. An annual or winter annual herb, reproducing by seeds.
Habitat. Cult ground, waste places, neglected yards, gardens, and roadsides.
Range. Throughout most of the US and s Canada.
Distr in NYS. Occasional as a weed.
Distr in the Torrey Range. Rare and local as a weed but frequently rather common near old gardens and along roadsides.
Time of Fl. (Late May)Jul-Sep; Jun-Oct at Cornell.
Origin. Natzd from Eu.
Remarks. Sometimes confused with Lychnis alba; see that species above for a discussion of the differences between these two plants.

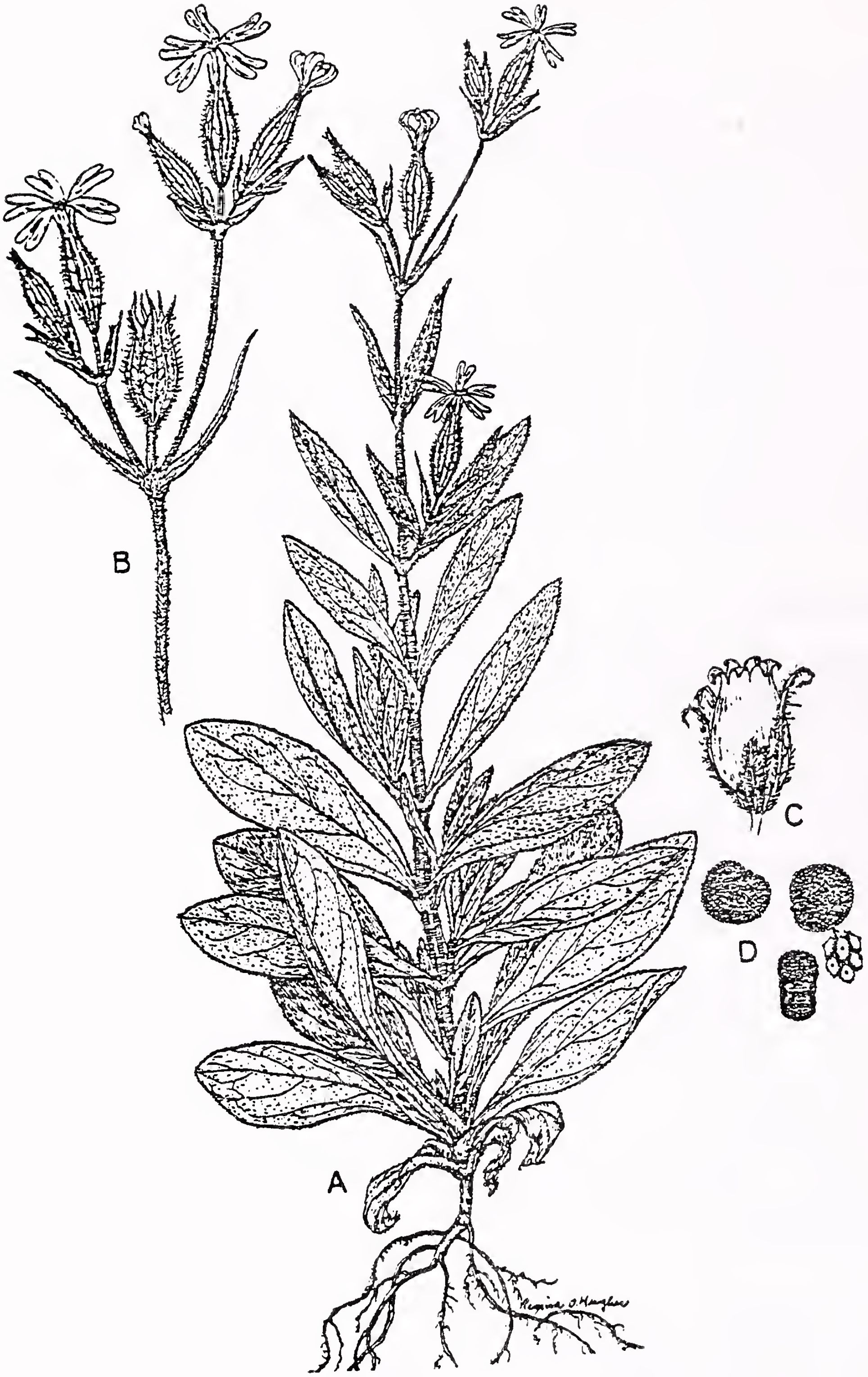
In some areas this species has become an undesirable weed. Muenscher (1952) states that badly infested meadows should be mowed early before seeds are formed, followed by fall plowing and planting a clean cultivated crop the next year. Scattered plants can be pulled or hoed by hand; grainfields should be harrowed. One way to prevent infestation is to plant pure clover and alfalfa seed.

Spérgula L. Spurry.

There are about five species of Spergula, all natives of the old world. The name of the genus is derived from the Latin spargere, to scatter, from the sowing of the seeds to produce quick-growing early forage, or perhaps referring to the ready seed-dispersal of the plants.

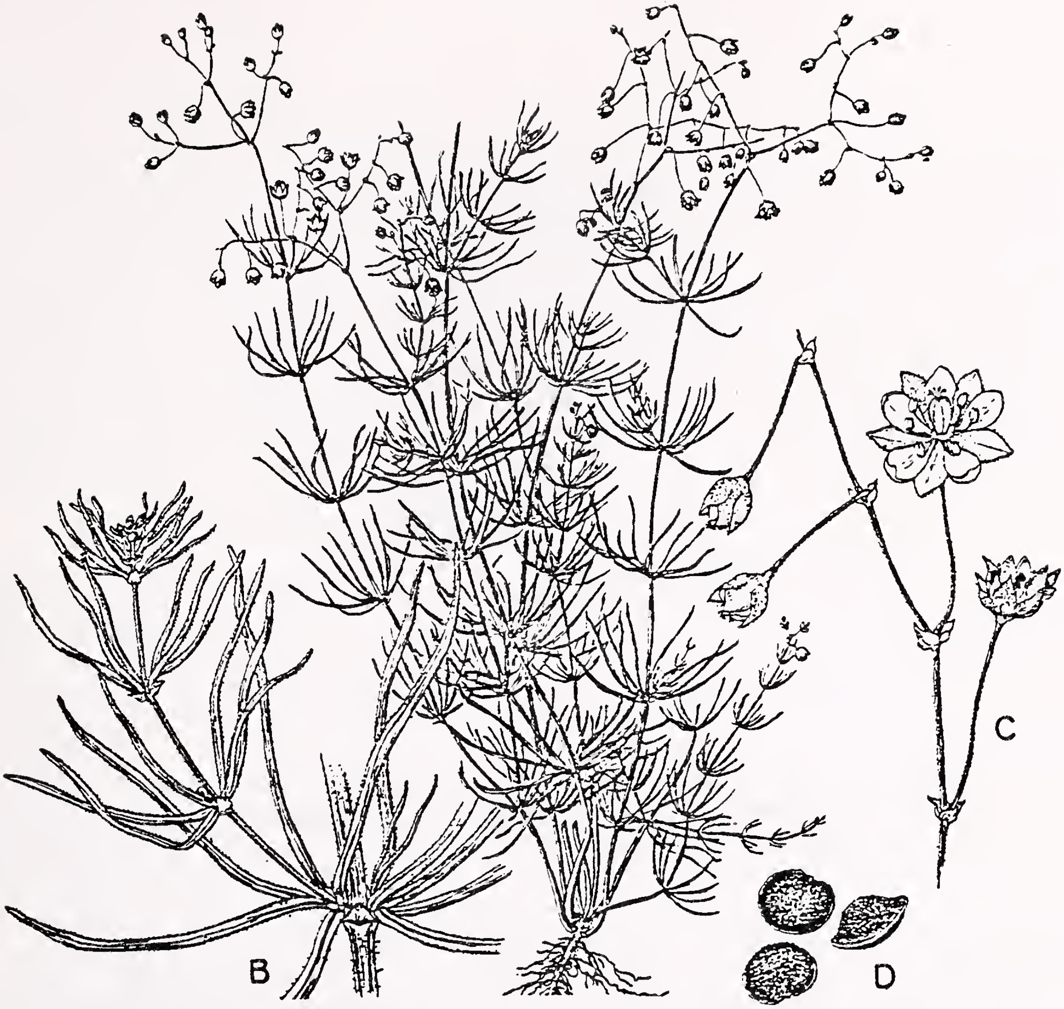
Spérgula arvénsis L. Corn Spurry.

Meaning of Species Name. Of cultivated fields.
Other Names. Sandweed, Pick-purse, Poverty-weed, Pine-cheat, Yarr.



Silene noctiflora--Night-flowering Catchfly
[From USDA Agr. Research Sv. (1971), Fig 80, p. 165.]

Type of Plant. An annual herb, reproducing by seeds.
Habitat. Cult ground, grainfields, and waste places.
Range. NS to Ak, s to Fla and Cal.
Distr in NYS. Common as a weed.

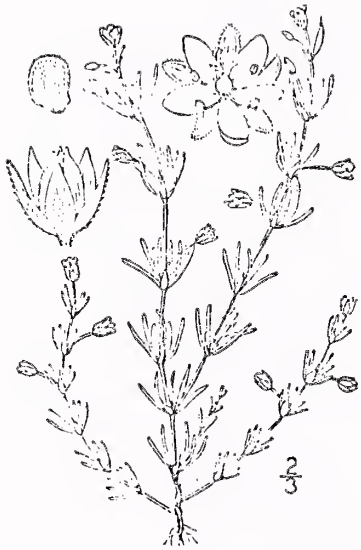


Spergula arvensis--Corn Spurry
[From USDA Agr. Research Sv. (1971), Fig. 81, p. 167.]

Distr in the Torrey Range. Common as a weed throughout the cult areas in the range, but often locally wanting.
Time of Fl. Mar-Oct; Jul-Aug at Cornell.
Origin. Natzd from Eu.
Remarks. A widespread weed, bright green in color.

Corn Spurry is reported to have been used as a source of famine-bread in Finland and Scandinavia, but all accounts seem to be derived from one by Linnaeus written nearly two centuries ago stating that in times of great scarcity, when nothing better was available, the seeds of Corn Spurry, "after being dried, are ground and baked, along with a small proportion of corn [wheat]." All members of this group contain saponin, a bitter and somewhat poisonous principle, so that only under stress is it desirable to use the seeds for food. Johnson (1867) reported that "The plant is largely grown in Germany, Holland, and other parts of Europe for fodder.... In nutritive qualities [it] is exceeded by very few plants of the kind.... the herbage and seeds are eaten by poultry, and the hens are said to lay better in consequence."

In areas where this species has become an obnoxious weed, Muenscher (1952) suggests that grainfields should be disked or harrowed after the crop is removed to induce the seeds to germinate. Clean cultivation, followed by hand hoeing and hand pulling, is also effective.



Spergularia rubra--Purple Sandwort
[From Britton & Brown (1913), Vol. II, p. 60.]

Spergulària J. & C. Presl. Sand-spurry.

This genus comprises about 50 species of wide distribution in temperate zones. They are low herbs, most of ours being chiefly annuals or biennials that flower all summer and grow in or near saline or alkaline habitats. They are characterized by linear or setaceous, opposite, stipulate leaves, with smaller leaves often clustered in the axils. The name of the genus is derived from *Spergula*, Spurry, which these plants much resemble.

Spergulària rùbra (L.) J. & C. Presl. Purple Sandwort.

Meaning of Species Name. Red, from the color of the flowers.

Other Names. Bed-sandwort, Common Sand-spurry.

Type of Plant. An annual or short-lived perennial herb.

Habitat. A weed of dry sandy or gravelly soil in waste places and along roadsides.

Range. Nf to Minn, s to Va, Ala, and NM; also Ore to Cal.

Distr in NYS. Common in various localities on LI, SI, and about NYC; near Albany, Syracuse, Rochester, and Buffalo, and doubtless also in other places.

Distr in the Torrey Range. Frequent, especially near the coasts, decreasing inland.

Elevation. Collected at 1200 ft in Delaware co.

Time of Fl. May-Sep; Jul-Aug at Cornell.

Origin. Apparently indig along the Gulf of St Lawrence; natzd from Eu elsewhere.

Stellària L. Chickweed, Starwort.

There are nearly 100 species of Stellaria, a genus of wide distribution, most numerous in the north temperate zone. The flowers are solitary or cymose, terminal or appearing lateral by the prolongation of the stem from the upper axils. Some are common garden weeds, the best known of which is S. media, the common Chickweed. S. holostea is well known in cultivation. Another plant of horticultural value is S. graminea var. aurea, a slender-stemmed plant with narrow, pale yellow, linear leaves and small, white, star-shaped flowers in summer. It is sometimes used as an edging for summer flower beds. The name of the genus is derived from the Latin stella, star, in allusion to the star-shaped flowers.

Key to the Catskill Species of Stellaria

1. Styles normally 5 (leaves large, ovate to ovate-lanceolate, acute; cymes open, leafy).................................. S. aquatica
1. Styles normally 3, 2
  2. Leaves ovate, the lower and middle distinctly petioled; weak stems and branches filiform, not angled; calyx often pilose... S. media
  2. Leaves linear, lanceolate or elliptic (rarely ovate), mostly sessile or essentially so; stems and branches 4-angled; calyx glabrous, 3
    3. Flowers pedicelled, in the axils of foliage leaves or, if cymose, with leaflike bracts (leaves soft or thin, scarcely keeled, blunt or merely acute, elliptic or narrowly ovate to linear, with definite midrib, ciliolate at base; capsule much exceeding calyx)............................ S. calycantha
    3. Flowers in well-developed cymes with small scarious bracts, 4
      4. Cymes terminal or terminal and axillary, long peduncled; sepals firm, ribbed, in maturity 3.5-8 mm long; petals conspicuous (inflorescence loosely dichotomous, with many flowers, the fruiting pedicels divergent).... S graminea
      4. Cymes all (or nearly all) axillary; sepals almost nerveless, in maturity 2.5-4 mm long, 5
        5. Leaves linear, long-attenuate; cymes long-peduncled, open, with strongly divergent branches; flowers 5-7 mm broad, with evident petals; capsules 4-6 mm long; seeds smooth................................ S. longifolia
        5. Leaves oblong or elliptic-lanceolate; cymes sessile or short-peduncled, with ascending branches; flowers smaller, with inconspicuous or no petals; capsules 3-3.5 mm long; seeds pebbled......................... S. alsine

An alternate approach to four of the Catskill species of Stellaria is provided by the following key:

1. Petals shorter than the sepals or lacking, 2
  2. Seed strongly papillate; cymes few-flowered, appearing lateral; stems decumbent, often rooting at the nodes; flaccid plants of wet habitats.. S. alsine
  2. Seed essentially smooth; flowers solitary or in terminal cymes; stems not rooting at the nodes; plants of drier habitats .... S. calycantha

1. Petals conspicuously surpassing the sepals, 3
    3. Inflorescence many-flowered (except in depauperate specimens); leaves lanceolate, broadest just above the base; sepals 4-5 mm long, acute or acuminate, strongly 3-nerved, most frequently ciliolate; seed coarsely tuberculate; inflorescence more ample and more commonly appearing terminal than that of the next species; stem smooth, round............................ S. graminea
    3. Inflorescence few-flowered (seldom many-flowered); leaves linear, subacute at both ends, often broadest at or above the middle; sepals 2.5-4 mm long, acute, weakly 3-nerved, seldom ciliolate; seed essentially smooth; inflorescence soon becoming lateral; stem often rough-angled.................. S. longifolia

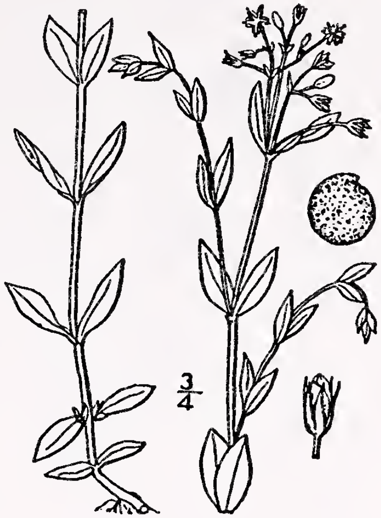
Stellaria alsine Grimm. Bog Starwort.

Meaning of Species Name. For Alsine, an inclusive early name for several genera.
Other Names. Marsh Chickweed, Bog Stitchwort, Swamp Stitchwort, Marsh Stitchwort.
Type of Plant. An annual or biennial herb, reproducing by seeds.
Habitat. Cold marshes, springs, borders of rills, and brooks.
Range. Nf and Que to Del, Md, Pa, and w NY; also in Ga and BC.
Distr in NYS. Rare and local; Orange, Sullivan and Delaware co within the drainage of the Delaware r, and at Queens, LI, and Rossville, SI.
Distr in the Torrey Range. NY: Orange, Sullivan, and Delaware co, within the drainage of the Delaware r and at Queens, LI.
Time of Fl. May-Aug.
Origin. Native.
Remarks. Also in Eu.

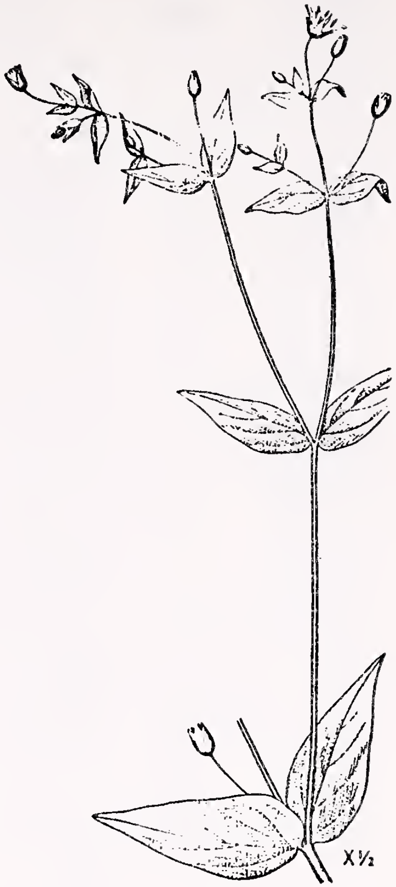
It is sometimes rather difficult to distinguish Stellaria alsine from S. calycantha, both trailing or diffuse plants with prolonged stems growing in wet places. The bracts of S. alsine are small and scarious, however, while those of S. calycantha are leaflike, and S. alsine is rather fleshy, while S. calycantha is not. In addition, the seeds of S. alsine are strongly pebbled while those of S. calycantha are essentially smooth. A further point is that the sepals of S. alsine are lanceolate, sharply acuminate, and 2-3 mm long, while those of S. calycantha are broadly lanceolate to oblong, acute or blunt, and 2-5.5 mm long. The latter species, which usually grows in drier habitats than does S. alsine, is actually quite rare in the Catskill region.

Stellària aquática (L.) Scop. Giant Chickweed.

Meaning of Species Name. Aquatic.
Synonyms. Myosoton aquaticum (L.) Moench in Fernald (1950).
Other Names. Water Mouse-eared Chickweed, Water Chickweed, Great Starwort, Star Chickweed, Stitchweed.
Type of Plant. A perennial herb, reproducing by seeds.
Habitat. Wet meadows, alluvial thickets, shores, and waste places, often in muddy or waste soil.



Stellaria alsine--Bog Starwort
[From Britton & Brown (1913), Vol. II, p. 43.]



Stellaria aquatica--Giant Chickweed
[From Britton & Brown (1913), Vol. II, p. 42.]

Range. Ont to Minn, s to Del, NC, WVa, La, O, and Ill; also in BC.
Distr in NYS. Infrequent but reported from many localities across the state.
Distr in the Torrey Range. A rare and local weed, in 1915 known definitely only near Philadelphia and New York City.
Time of Fl. May-Nov.
Origin. Natzd from Eu.
Remarks. Fernald (1950) states that it is local, but in the Catskills it appears to be spreading rapidly.

An infusion of the entire mature plant has been used in medicine in the treatment of tuberculosis and lung congestion. The juice of the plant, which is high in vitamin C, has also been used as a tonic after illness and to treat scurvy.

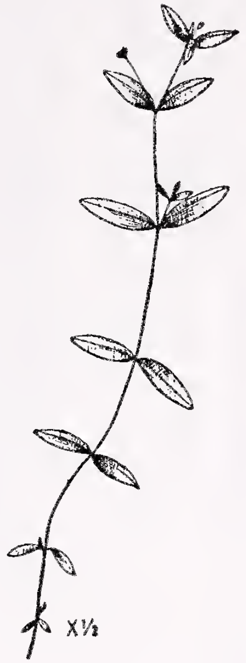
Stellària calycántha (Ledeb.) Bong. Northern Stitchwort.

Meaning of Species Name. Calyx-flowered.
Type of Plant. A weak perennial herb, reproducing by seeds.
Habitat. Cool, moist, and usually shaded situations.
Range. Circumpolar; in NAm from Gl to Ak, s to NY, WVa, Utah, and Cal.
Distr in NYS. Infrequent or rare across the n part of the state, s to Washington co, Whitestown, Oneida co, s Herkimer co, Dutchess and Sullivan co, and locally across the state westw in cold deep swamps.
Distr in the Torrey Range. NY: Pine Plains, Dutchess co, and from Ulster, Greene, Delaware, and Sullivan co.
Elevation. Grows to 6280 ft in NH; collected at 2300 ft in Delaware co.
Time of Fl. Jun-Aug; Jun at Cornell.
Origin. Native.

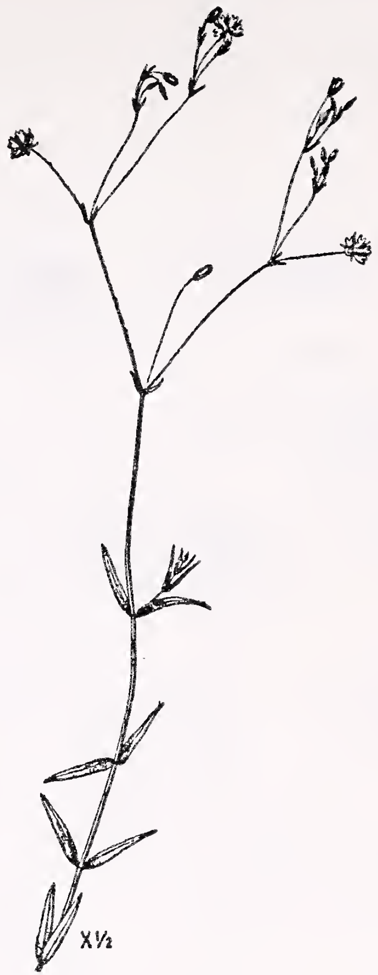
Stellària gramínea L. Lesser Stitchwort.

Meaning of Species Name. Grasslike.
Other Names. Grass-leaved Stitchwort, Grassy Starwort, Common Starwort, Common Stitchwort.
Type of Plant. A perennial herb, reproducing by seeds and creeping stems.
Habitat. Fields, meadows, grassy places, roadsides, and waste land.
Range. Nf to Ont and Minn, s to SC, WVa, O, Ind, and Mo; also in Wash.
Distr in NYS. Common across the state and locally into the Adirondack reg; less common in the w counties of the state, and rare on the s side of LI.
Distr in the Torrey Range. Common throughout the range except in s NJ and the pine barrens of LI.
Time of Fl. May-Jul; Jun-Jul at Cornell.
Origin. Natzd from Eu.

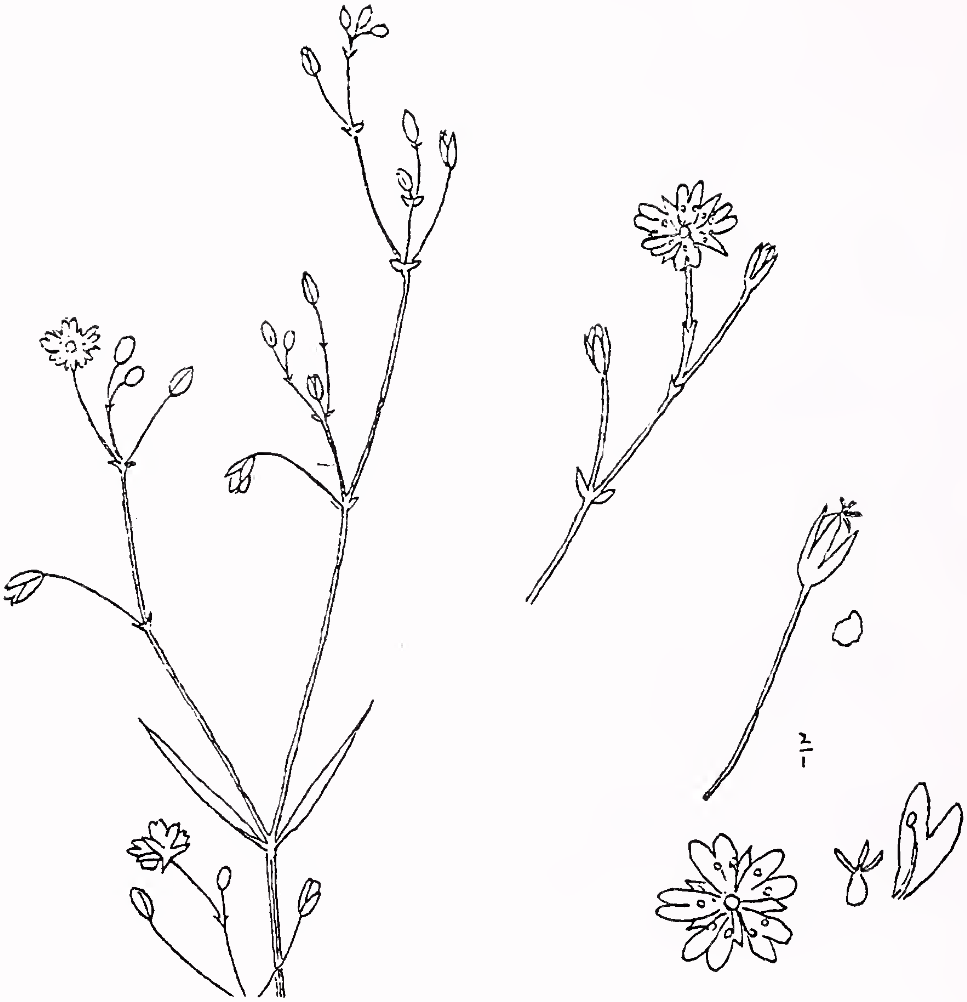
In areas where this species has become an undesirable weed, Muenscher 952) suggests that the application of fertilizer to stimulate the crop nts will drive out this species; clean cultivation is also effective.



Stellaria calycantha--Northern Stitchwort
[From Gleason (1952), Vol. II, p. 127.]



Stellaria graminea--Lesser Stitchwort
[From Gleason (1952), Vol. II, p. 127.]

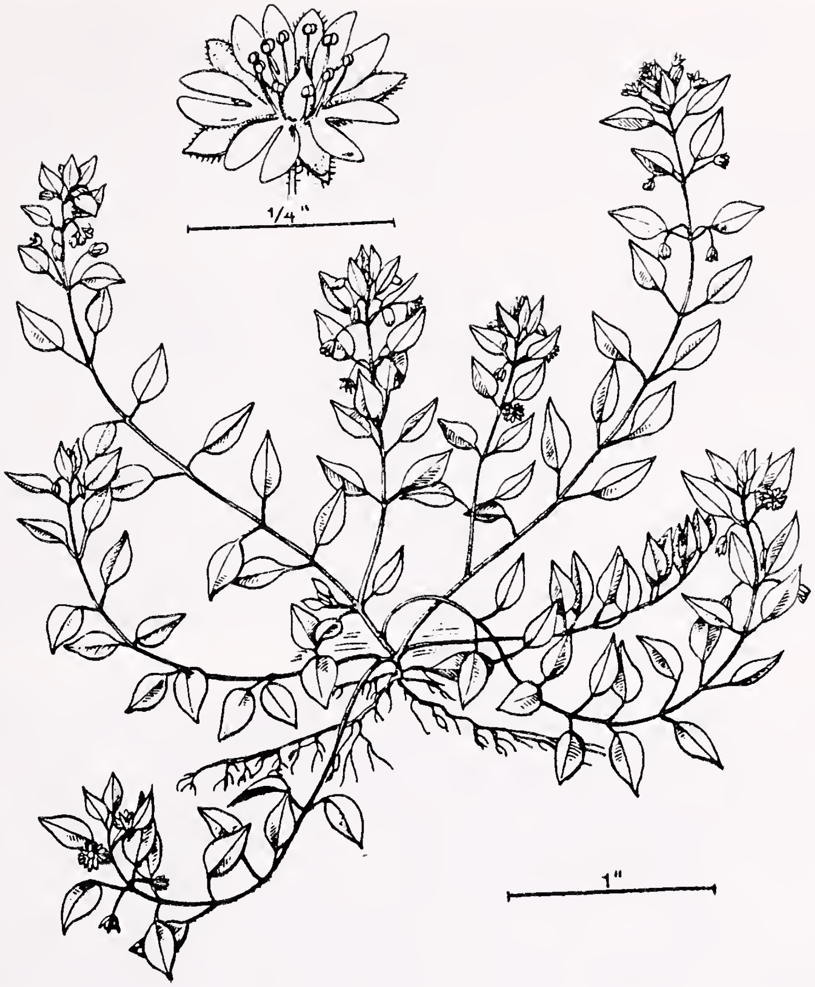


Stellaria longifolia--Long-leaved Stitchwort
[From Stone (1945), Vol. I, p. 571.]

Stellaria longifòlia Muhl. Long-leaved Stitchwort.

Meaning of Species Name. Long-leaved.
Type of Plant. A perennial herb, reproducing by seeds.
Habitat. Damp thickets, low, moist meadows, marshes, shores, and swamps.
Range. Lab and Nf to Ak, s to SC, Ky, La, Mo, Neb, Ariz, NM, and Cal; also in n Eurasia.
Distr in NYS. Common throughout the state except on LI, where it is rare; rare or absent in the higher Adirondacks.
Distr in the Torrey Range. Common throughout the range except in the pine barrens of NJ and e and s of them; rare on LI.
Time of Fl. May-Jul; May 20-Jul 10 at Cornell.
Origin. Native.

S. longifolia is frequently confused with *S. graminea*. One authority states that the only character by which the two can be distinguished is the inflorescence, branched divaricately in the former and ascending in the latter. Both Taylor and House state that this species is common, but there are few records of it in the Catskill region.



Stellaria media--Common Chickweed
[From Krochmal et al (1971), p. 243.]

Stellària mèdia (L.) Cyrillo. Common Chickweed.

Meaning of Species Name. Intermediate.

Other Names. Starwort, Starweed, Bindweed, Winter-weed, Satin-flower, Tongue-grass, White Bird's-eye, Chicken-weed, Star Chickweed, Mouse-ear.

Type of Plant. A weak annual or winter annual, reproducing by seeds and creeping stems rooting at the nodes.

Habitat. A weed of dooryards, cult fields, gardens, waste places, meadows, and damp woodlands.

Range. Throughout the US and s Canada.

Distr in NYS. Very common.

Distr in the Torrey Range. Common as a weed almost everywhere.

Elevation. Collected at 2300 ft in Greene co.

Time of Fl. Feb-Dec; Mar-Dec at Cornell.

Origin. Natzd from Eu but often appearing native.

Remarks. A cosmop weed; under favorable conditions, flowers are produced throughout the year.

This annual herb, another native of Europe, has become naturalized practically the world over. It is a hardy plant in spite of its frail appearance; it resists frost even in our northeastern states and can be found in bloom throughout the year in sheltered situations. Despised as a pesky weed of gardens and shaded dooryards, most Americans are surprised to learn that many European writers are enthusiastic in their praise of this plant as a desirable substitute for Spinach, for it is much used as such in many parts of that continent. The Indians also used the seeds for making cakes and to thicken soups, in addition to employing the young leaves and stems in stews. The greens can be eaten raw in salads mixed with other greens, wild or domestic, but preference seems to be their use as a cooked vegetable, either as a substitute for Spinach or in stews, to which they add a taste similar to that of Okra. In 1862 C. P. Johnson, writing on useful plants of Great Britain, stated that when boiled, Chickweed makes an excellent green vegetable, "much resembling spinach in flavour, and very wholesome. Being found at all seasons of the year, ... it might be used for culinary purposes with advantage, in many cases, where garden vegetables are not attainable." Berglund and Bolsby (1971) also suggest adding the leaves to pancake batter for added flavor. In any case, it is a plant that is available as a food item much of the year, but only the young shoots are palatable, for the bases of the older plants become stringy with age.

When used alone as a boiled green, Chickweed is mild and bland, with a slight herbal flavor; most persons therefore prefer to add it to such stronger-flavored greens as Watercress, Dandelion greens, or Winter Cress, using two parts of Chickweed to one part of the stronger greens. Chickweed is so tender that it cooks almost instantly, so the stronger greens are first cooked about 10 minutes before the Chickweed is added. After the water has again come to a boil, cook for 2 minutes longer, drain, chop, and season with salt, butter, and a little pepper sauce. Soy sauce likewise makes an excellent dressing for this as well as other greens. Each serving can be garnished with crumbled crisp bacon and some finely chopped raw onion.

Chickweed is listed in practically every old herbal as a demulcent, emollient, refrigerant, antiscorbutic, and as a low-calorie vegetable for a reducing diet. An antiscorbutic is actually a source of vitamin C, the lack of which results in the disease called scurvy. Chickweed, being rich in vitamin C, was formerly a very important antiscorbutic because it could be obtained during the winter when most other green vegetables were not available. Juice of the fresh plant was given internally. Eating boiled Chickweed and drinking the broth was also long an old wives' remedy for obesity, but probably the greatest use of Chickweed was either as an external poultice or in the form of an ointment in the treatment of boils, infections (particularly those of the eyes), skin sores, hemorrhoids, inflammation, ulcers, carbuncles, and abscesses. The fresh herb was covered with boiling water, then allowed to cool enough to be applied to the affected part. In addition to being bound loosely to the sore and changed often, the affected part was washed frequently with the water in which the herb was steeped. Crushed fresh leaves were also applied as poultices. The fresh plant chopped and boiled in lard was considered a fine cooling ointment for piles, sores, and external abscesses, and a decoction of the fresh plant was thought to be useful in relieving constipation, while an infusion of the dried herb was administered in the treatment of hoarseness and sore throat. In all probability the Indians learned the medicinal uses of this plant from the whites, for they used it in much the same way. Densmore (1928) reports that the Chippewas put a handful of leaves in hot water, let them stand for a while, set the liquid aside until it was lukewarm, then strained out the leaves. The resulting decoction was applied externally as a wash for sore eyes and muscular soreness. These uses might lead one to suspect that perhaps this herb may contain some antibiotic substance as yet unidentified by modern science. In any case, it is still in current demand as a drug plant.

Chickweed seems to have received its common name from the fact that wild birds as well as domestic fowl relish both its seeds and foliage. The small seeds are sometimes found in seed given to caged birds. As a matter of fact, this is the only species of Stellaria of importance to wildlife; a complete list of the songbirds and gamebirds that make use of its numerous small seeds and tender foliage would be a long one. Martin et al. (1951) list 32 birds, in addition to rabbits and mountain sheep, as making use of this plant. Domestic sheep are reported to be indifferent to it, while goats, surprisingly, are said to refuse to eat it; but hogs are fond of it, and cows and horses will eat it. Steyermark (1963), however, reports that cases of poisoning have been reported where young lambs have eaten quantities of this plant.

In areas where this plant has become an undesirable weed, it can be controlled by clean cultivation and hand weeding, especially when the seedlings are small. Lawns where this weed has become well established should be mowed close to the ground and the infested area sprayed with a weed killer. Liming the soil is often helpful, but Spencer (1968) suggests that perhaps the best solution is to dust the plants with ammonium sulphate while the dew is on. This will not only burn the plants enough to kill them, but, since ammonium sulphate is a good fertilizer for lawns, a heavy sprinkling of water late in the day will deposit the fertilizer in the soil. The grass may be burned as well, but its perennial roots will be stimulated to produce new growth in a short time. This will help to produce a good sod, which is one of the best protections against Chickweed invasion. Bare patches should of course be reseeded and fertilized. This weed makes its most vigorous growth in cool weather and when considerable moisture is available, so particular care must be taken during those times to eradicate the plant before seed can be produced.

RANÀLES

This is a large order, traditionally comprising 19 families and more than 330 genera, exhibiting diverse types of flower structure but generally characterized by the flower parts typically spirally arranged and the perianth often not differentiated into calyx and corolla. It is generally considered to be the most primitive order of the Angiospermae. Among our plants the primitive condition is best illustrated by the Magnoliaceae. Among the several other families belonging to this order is the Myristicaceae, the Nutmeg family, source of the commercial spice Nutmeg. Cronquist (1968), on the other hand, divides the dicots into six subclasses, of which he considers the Magnoliidae as "the basal complex, from which the other angiosperms have been derived." In his words, "The Magnoliidae consist of nearly all of what has been called the Ranalian complex, plus a few other families." It is "clearly the most primitive subclass ... of the angiosperms," and, as defined by him, consists of 6 orders, 36 families, and more than 11,000 species. These six orders include the Magnoliales, Piperales, Aristolochiales, Nymphaeales, Ranunculales, and Papaverales. The Aristolochiales and Papaverales, "which have not generally been included in the Ranalian complex," Cronquist considers as "short evolutionary side-branches which have not given rise to other large groups."

Gleason (1952) distinguishes the six Catskill families of this order, at least in part, as follows:

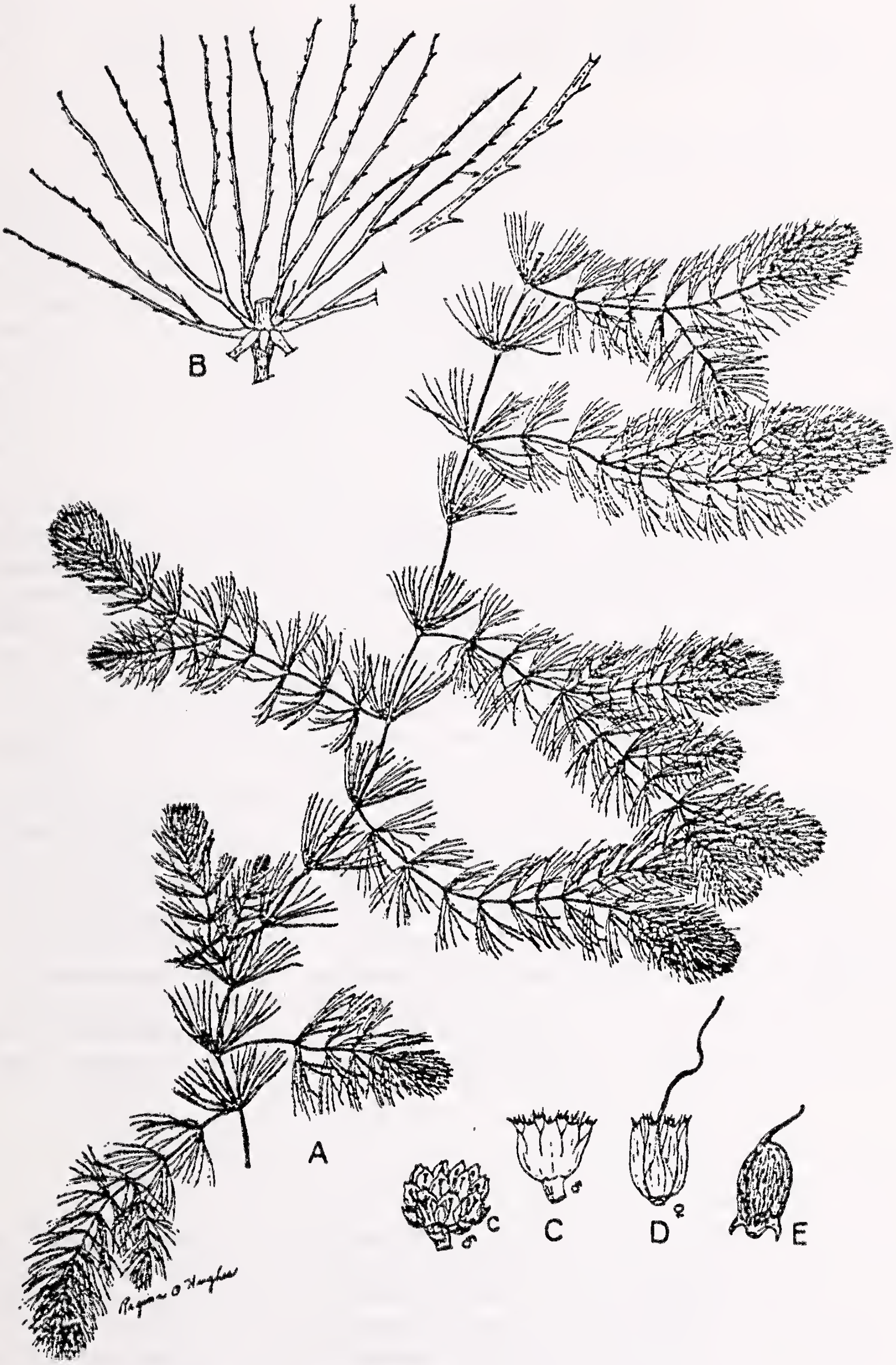
1. Perianth none; pistil 1; submersed aquatics with whorled dissected leaves.. Ceratophyllaceae
1. Perianth present; pistils 1 or more, 2
   2. Aquatic plants, the floating leaves entire, peltate or deeply cordate (principal leaves in Cabomba deeply dissected). Nymphaeaceae
   2. Aquatic or terrestrial plants; when aquatic, with leaves of a different type from those above, 3
      3. Perianth in 3 or more whorls or 3 segments each; stamens numerous; pistils few to many (leaves stipulate, the base of the stipule encircling the stem)................. Magnoliaceae
      3. Perianth of a different type, 4
         4. Petals none; flowers usually 3-merous; stamens in 1-4 whorls or 3; pistil 1 (anthers opening by flaps).... Lauraceae
         4. Petals commonly present; if absent, the stamens numerous, 5
            5. Pistils usually several to many; stamens numerous, spirally disposed............................ Ranunculaceae
            5. Pistil 1; stamens usually as many or twice as many as the petals, cyclic......................... Berberidaceae

CERATOPHYLLÀCEAE, the Hornwort Family

These are monoecious, submerged, perennial, aquatic plants with whorled leaves dichotomously divided, the filiform or linear segments with serrulate margins. The family, represented by a single genus and three or four species, is of cosmopolitan distribution, best represented in this country by Ceratophyllum demersum, often common in shallow stagnant or slow-moving waters. The family is recognized by the whorled dichotomously dissected serrulate leaves and by the unisexual flowers solitary in the axil of one leaf of a whorl. The Ceratophyllaceae undoubtedly are of close affinity with the Nymphaeaceae; indeed, Cronquist (1968) places this family in his order Nymphaeales, together with Nymphaeaceae and Nelumbonaceae. Economically the family is of little importance, although the plant is of value in wildlife conservation practices as a protective cover for freshly laid spawn and young fish fry.

Ceratophýllum L. Hornwort.

The name of the genus is derived from the Greek keras, horn, and phyllon, leaf, referring to the branched leaves. It is our only genus of submersed plants with leaves whorled and palmately dissected.



Ceratophyllum demersum--Coontail
[From USDA Agr. Research Sv. (1971), Fig. 83, p. 171.]

Ceratophýllum demérsum L. Coontail.

Meaning of Species Name. Submerged.

Other Names. Hornwort, Hornweed, Morass-weed.

Type of Plant. A perennial aquatic herb, reproducing by seeds and winter buds.

Habitat. Quiet waters of ponds and streams.

Range. Que to BC, s beyond our range; also widely distr in the old world.

Distr in NYS. Infrequent or locally abundant across the state; apparently absent from most of the n Adirondack reg but common in many of the lakes and slow streams of the c and w parts of the state, the St Lawrence reg, and along the s shore of L Ontario.

Distr in the Torrey Range. Throughout the range except in the pine barrens.

Time of Fl. Jul-Sep; Jun-Jul, fr Aug at Cornell.

Origin. Native.

This fine-leaved submersed aquatic may sometimes be anchored in mud, but, lacking roots, it is more often found floating unattached in the quiet waters of ponds and lakes. The dense crowding of leaves toward the ends of the branches gives the appearance of a fluffy tail, whence the name Coontail. The length of individual plants varies greatly, depending on whether or not they have been broken up, the individual pieces then functioning as separate plants. Late in the season some of the tips become coarse and rather bunchy, eventually sinking to the bottom, where they serve as winter buds to preserve the plant until the next growing season.

The minute flowers are seldom observed, but achenes are usually produced in large numbers and are easily collected in late summer and early autumn. Both seeds and leaves are eaten by aquatic birds, including ducks, but Martin et al. (1961) report that, since they seem not to be a choice item, "the quantities taken are hardly in proportion to the abundance and widespread availability" of this aggressive plant, which, in many places, competes with and crowds out more desirable plants. On the other hand, these plants afford shelter both for young fish and many aquatic insects, consumed by fish and birds. This plant is also available commercially for use in pools and aquaria both as an ornamental and to help oxygenate the water.

NYMPHAEÀCEAE, the Water-lily Family

These are aquatic plants with thick fleshy rootstocks or tubers embedded in the mud, from which grow circular shieldlike leaves and leafless flower stalks, each terminated by a single flower, often of great beauty, and consisting of four or five sepals and numerous petals gradually passing into the very numerous stamens without any definite line of demarcation between them. It is a family of eight genera and about 90 species, widely distributed in fresh waters over much of the earth. The family is distinguished by the aquatic habit, the usually long-petioled, latex-producing, peltate or pseudopeltate leaves, and long-peduncled flowers. Three genera are tropical; Brasenia is indigenous to all continents except Europe; Nymphaea and Nuphar occur throughout most of the northern hemisphere, while

Cabomba is a new world genus. Species of all genera except one are commercially available as garden or conservatory ornamentals. The large rhizomes of Nelumbo lutea were once important to the American Indian as a source of starchy food.

Under the general head of "water-lily" are included the lotus of Egypt, Nymphaea lotus, and the sacred lotus of India and China, Nelumbo nucifera, formerly a native of the Nile (as shown by Egyptian sculptures and other evidence) but no longer found there. The latter plant has been held sacred throughout the East almost from time immemorial. Sturtevant (1919) reports that "It is fabled that the flowers obtained their red color by being dyed with the blood of Siva when Kamedeva wounded him with the love-shaft arrow." Both the roots and seeds are edible and have long been used as food in Egypt, in China, and in some parts of India and Ceylon. Large quantities of the seeds were once grown in the southern provinces of China; they have been pronounced "of delicate flavor and not unlike the pine cones of the Appennines." In Japan the stems, "not dissimilar in taste to our broad beet with a somewhat sharp aftertaste," are also eaten. In China the roots also furnish "a starch or arrowroot." The gigantic Victoria regia, with leaves 6 to 7 feet in diameter and flowers 8 to 16 inches across, also belongs to this group. It grows in the backwaters of the Amazon, often covering the surface for miles; the seeds are eaten under the name of "water maize."

Key to Catskill Genera of the Nymphaeaceae

1. Leaves principally submersed, the submerged ones deeply and finely dissected (sepals and petals each 3; stamens 6; flowers cream-colored, spotted with yellow at base, 1-1.5 cm wide)....... Cabomba
1. Leaves principally floating or emersed, entire or nearly so, not dissected, 2
    2. Leaves entire, not split or cleft, the petiole joining the blade approximately at the middle of the blade (leaves elliptic, small, floating, mainly 0.2-1 dm across; stems and lower surface of leaves covered with a jelly-like, slimy coating; flowers dull purple, 2-3 cm wide; sepals and petals each 3).. Brasenia
    2. Leaves split or cleft on one side, the leaf stalk joining the leaf blade at the base of the cleft (sinus), 3
        3. Most of the main nerves of the leaf blade unbranched or forking only near the leaf margin; flowers yellow, with small, thick, stamen-like petals 6-9 mm long; the 5, 6, or more roundish petal-like sepals are yellow to red or purple; floating or aerial leaves oval; petiole and peduncle with numerous minute air cavities...................... Nuphar
        3. Main nerves of the leaf blade much branched and forked, at least half of them originating directly from the top of the petiole; flowers white, rarely pink, with many showy petals mostly 45-90 mm long, not like stamens: the 4 oblong-lanceolate sepals green or tinged with purple on the outside; floating leaves round or nearly so: petiole and peduncle with 4 large air passages.... [illegible]

Brasenia Schreb. Water-shield.

This hardy aquatic, a monotypic genus, is a native of North America, Asia, Africa, and Australia. The genus name is of unknown origin. The floating oval leaves are alternate, long-petioled, and centrally peltate. The stems, flower stalks, and under surfaces of the leaves are covered with a thick, transparent, jelly-like substance, a characteristic that readily identifies this species. The axillary flowers, each about half an inch across, are dull purple. It is sometimes planted as an ornamental at the edges of pools.

Brasenia schreberi Gmel. Purple Wen-dock.

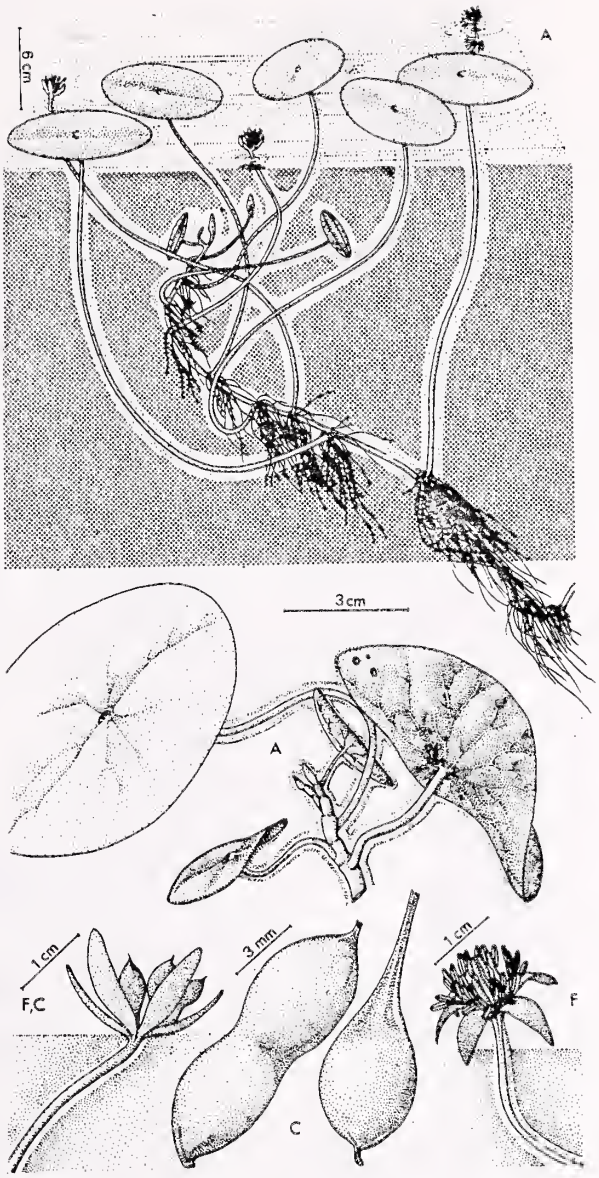
Meaning of Species Name. Named for Johann Christian Daniel Schreber, 1739-1810.
Other Names. Water-shield, Water-target, Deer-food, Frog-leaf, Little Water-lily.
Type of Plant. A perennial aquatic herb.
Habitat. In quiet water of ponds, lakes, and slow streams.
Range. NS and Que to Minn, s to Fla and Tex; Ida to BC, and Cal; also in CAm, Cuba, Asia, Afr, and Austral.
Distr in NYS. Common across the n part of the state; less frequent in the e and s secs of the state and in the ponds and bays along L Ontario.
Distr in the Torrey Range. Throughout the range and in some localities exceedingly common, usually decreasing northw and at greater elevations.
Time of Fl. Jun-Sep; Aug at Cornell.
Origin. Native.

In some sections of Japan the young leaves and stems, before the gelatinous covering is well developed, are said to be "eaten as a salad with vinegar." It is also stated that the Indians of California collected the tuberous rootstocks for food. Ducks are reported to be fond of the hard spherical seeds of this species. Since it is locally abundant only, however, its wildlife value is rather restricted, although it has been successfully transplanted in a number of ponds along the south Atlantic coast. Where abundant, the leaves also afford shade and shelter for fish.

Rafinesque (1828-30) remarks that "Deer and cattle are very fond of eating these leaves: they resort to the places where they grow plentifully, and even swim in the water in search of them." "Unnoticed as yet by all medical writers, but well known to the Indians," he further states that this species is "Mucilaginous, astringent, demulcent, tonic, nutritive, &c. The fresh leaves may be used ... in pulmonary complaints and dysentery ..."

Cabómba Aubl. Fanwort.

These are slender, mainly submerged aquatic plants with opposite or verticillate, finely dissected leaves, a few of which may reach the surface. It is a small genus of some 7 species native to the warmer parts of North and South America. The name of the genus is probably an aboriginal name.



Brasenia schreberi--Purple Wen-dock
[From Mitchell & Beal (1979), p. 33.]

Cabómba caroliniàna Gray. Carolina Fanwort.

Meaning of Species Name. Of Carolina.

Other Names. Cabomba, Carolina Water-shield, Washington Plant, Fish-grass.

Type of Plant. A perennial aquatic herb.

Habitat. Ponds and quiet streams.

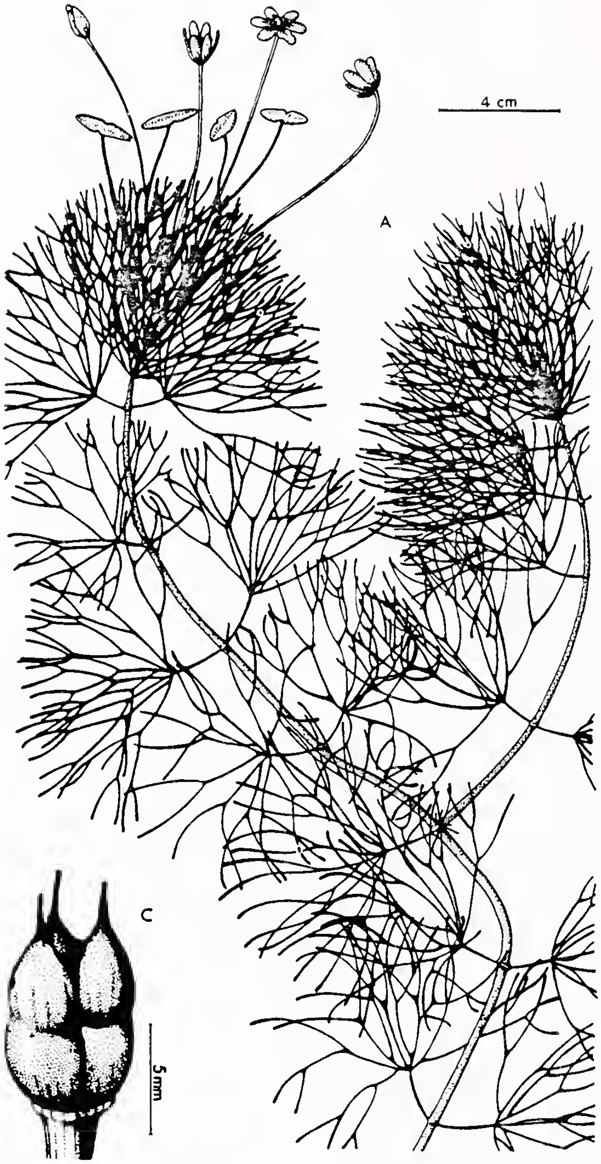
Range. NJ to O, s Mich, and Mo, s to Fla and Tex; natzd n to s NH and NY, where probably introd from discarded aquarium plants.

Distr in NYS. Not listed in House (1924).

Distr in the Torrey Range. Not listed in Taylor (1915).

Time of Fl. May-Sep.

Origin. Introd from the s states.



Cabomba caroliniana--Carolina Fanwort
[From Mitchell & Beal (1979), p. 32.]

This submerged aquatic plant is much grown in aquariums both for its decorative fan-shaped leaves and as an oxygenating plant, but it will not live for long in water unless it has soil in which to take root. Its submerged leaves are hairlike; its floating leaves, not always produced, are undivided, narrowly elliptical, and peltate. In its native haunts water birds sometimes eat its seeds, but it is considered of more value as food and cover for fish, although it can be a problematic aquatic weed in shallow ponds.

Nùphar Smith. Yellow Pond-lily, Cow-lily.

There are more than 20 species of Nuphar in the north temperate zone, hardy aquatic perennial flowering plants, natives of North America, Japan, and Europe. The name of the genus is believed to be of Arabic origin. They have floating leaves with a deep sinus at the base and chiefly yellow flowers, sometimes tinged with purple, produced all summer. The five or more sepals which constitute the showy part of the flower are concave, while the numerous petals are inconspicuous and resemble stamens. Cow-lilies are often planted at the margins of ponds or large tanks as ornamentals. Once planted, they need no further attention, except that their growth should be restricted to the allotted space.

Sturtevant (1919) reports that "A refreshing drink is made from its flowers by the Turks, and its roots and leaf-stalks are eaten by the Finns and Russians." Even in England it is reported that "some persons boil the seeds, when they are said to have a pleasant nutty flavour." Rafinesque (1828-30) remarks that "The roots, leaves, and nuts are edible ... The roots have some acrimony when raw, which they lose by roasting or boiling: they taste like Artichoke ... A kind of bread and cakes are made with them ... The petioles and young leaves may be eaten as greens; but the nuts are chiefly valued ... They are as good as filberts and chestnuts even raw ...; but better still when roasted."

To some of the northwestern Indians the seeds of the Cow-lilies were once a very important food item and several weeks each year were spent in harvesting them. J. S. Newberry reported in 1855 that he saw many hundreds of bushels of seeds collected for winter use among the west coast Indians and remarked that "the seeds taste like those of broom corn and are apparently very nutritious." The northwestern species, N. polysepalum, was so important to the Klamath Indians that a detailed bulletin on their use of the seeds was prepared in 1897 by F. V. Coville. Ceremonial dances were held before all tribe members participated in harvesting the ripe seeds. Briefly, the seeds were extracted after the pods were thoroughly dried in the sun and then pounded to loosen the seeds. Pods which had thoroughly ripened in the water and had begun to disintegrate, however, contained more valuable seeds. The seeds were parched on hot stones to loosen the kernels contained within, then pounded or lightly ground, and winnowed to get rid of the hard shells. The remaining white kernels, after the hard shells of the seeds had been removed, could be parched, when they swell considerably but do not crack like popcorn. Thus prepared, they were said to be "a delicious food, particularly if slightly salted and eaten with cream." The white kernels were also ground into flour for making bread, or the dried seeds with their shells on could be stored for winter use, to be parched and ground as needed. Indian tribes of the southern Appalachians, and no doubt elsewhere, also used the starchy rootstocks as a boiled or roasted vegetable, considered "a nourishing food." Berglund and Bolsby (1971) report that the seeds are still regarded as a favorite delicacy, but nowadays "The squaws usually go out in canoes to the lily patches and pick the full-grown pods while they are hard, or scoop up the already opened ones with a wicker spoon." The pods are then put in holes in the ground, where they are allowed to ferment, turning into a mucilaginous mass, after which the seeds are extracted by washing. They are then either cooked as a mush or merely parched.

These plants are of some value to wildlife as a source of food. The stems and leaves are consumed by deer and muskrat, the roots by beaver, and the seeds by wildfowl, while the lower surfaces of the leaves provide a habitat for aquatic insects and other invertebrates. Martin et al. (1961), however, were of the opinion that, despite their abundance, Yellow

Water-lilies were not only low in wildlife value but that in many localities they competed successfully with more valuable plants. Their seeds are eaten by ducks only to a limited extent.

Key to Subspecies

1. Fruit narrowly constricted below the stigmatic disc; stigmatic disc deeply crenate or dentate; anthers mostly 1-2 mm in length; sepals usually 5; petals mostly thin and broadly spatulate .... N. luteum ssp. pumilum
1. Fruit only slightly, if at all, constricted below the stigmatic disc; stigmatic disc crenate to entire; anthers mostly 5-8 mm long; sepals usually 6(-9); petals mostly thick and oblong, 2
   2. Petiole conspicuously flattened and winged on the upper surface; sepals (and carpels) often maroon colored... N. luteum ssp. variegatum
   2. Petiole terete to oval in cross-section, without wings; sepals usually green and/or yellow on the inner surface; carpels green to yellow.............................. N. luteum ssp. macrophyllum

Nùphar lùteum (L.) Sibth. & Son. ssp. macrophýllum (Small) Beal. Large-leaved Spatterdock.

Meaning of Species Name. Yellow; ssp. name, large-leaved.

Synonyms. N. advena (Ait.) Ait. f. in Fernald (1950); N. advena Ait. in Gleason (1952).

Other Names. Beaver-root, Bonnets, Cow-lily, Frog-lily, Dog-lily, Horse-lily, Beaver-lily, Spatterdock, Yellow Pond-lily.

Type of Plant. A perennial aquatic herb.

Habitat. Tidal waters, pond margins, swamps, and slow streams.

Range. Me and Ct to Mich, Wis, and Neb, s to NC, Ky, Ark, Tex, and e Mex.

Distr in NYS. Rare in the e, c, and w secs of the state; more common southw, especially on LI.

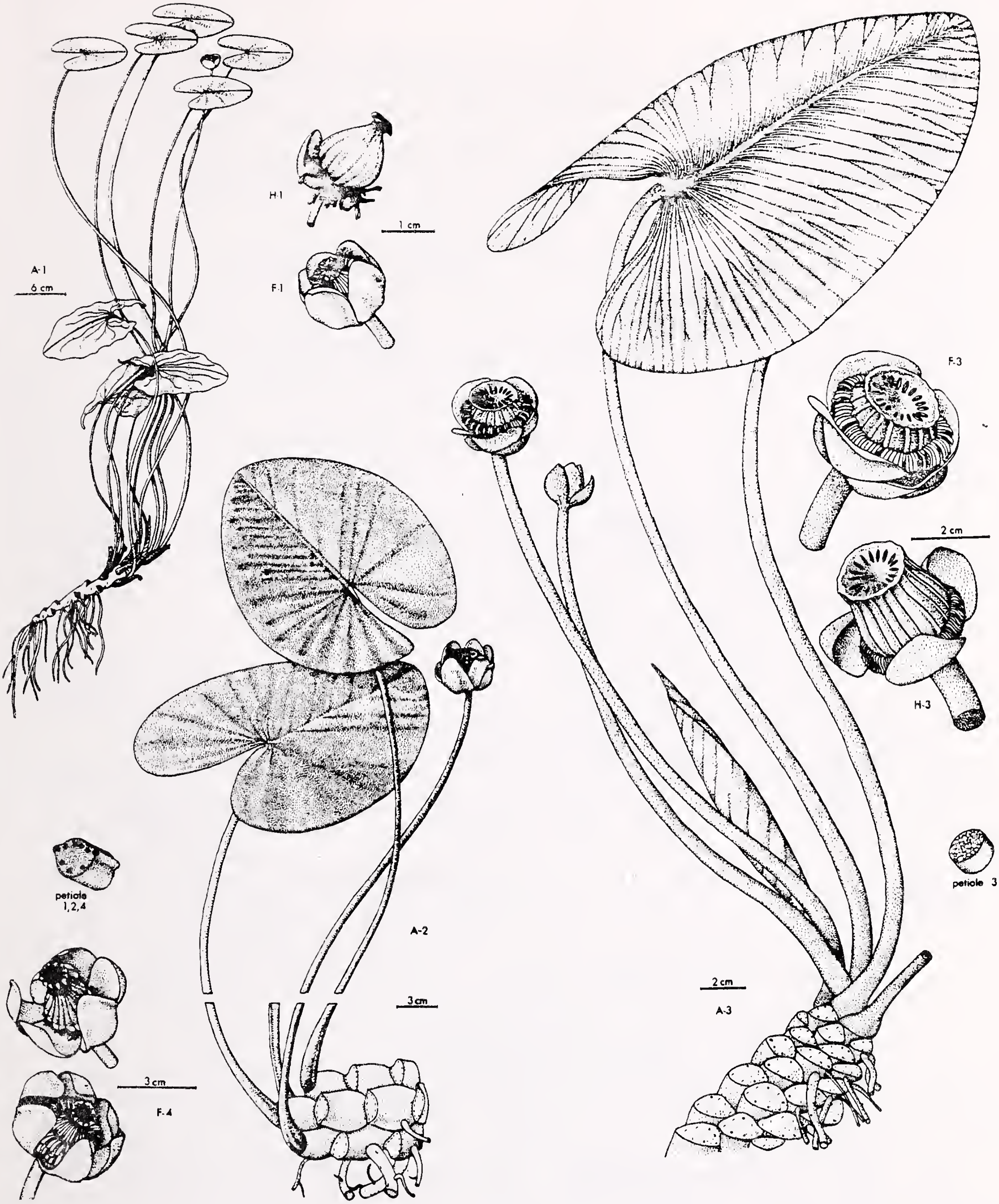
Distr in the Torrey Range. Common throughout the range in some of its forms.

Time of Fl. May-Oct; Jun-Aug at Cornell.

Origin. Native.

Remarks. The most abundant or the only subspecies over much of the northeastern states.

Although the seeds of this genus which have become most famous are those of the western N. polysepalum, the large-flowered species of eastern America are so similar that it would furnish as valuable seeds, but the chief use of the eastern species by the Indians seems to have been of the rootstocks. These, like the rootstocks of the western species, contain considerable starch, in spite of their spongy texture, and were used as a boiled or roasted vegetable. John Josselyn, one of the first chroniclers of New England natural history, reported in 1672 that "The Indians Eat the Roots, which are long a boiling, they tast like the Liver of a Sheep." Gathering these rootstocks from the bottoms of the lakes and ponds where they grew was often a time-consuming task performed by the women. While they sometimes dove to the bottom in search of these roots, they usually found it simpler to feel around for them in the mud with their feet. The roots were also sometimes stolen from



Nuphar luteum (L.) Sibth. & Smith. The three subspecies native to New York State are illustrated above, designated as follows: A-1, ssp. *pumilum*; A-2, ssp. *variegatum*; A-3, ssp. *macrophyllum*. Flowers of hybrid intermediates ("× *N. rubrodiscum*") between the two varieties at the left are also shown (F-4).

Nuphar luteum--Yellow Pond-lily
[From Mitchell & Beal (1979), p. 28.]

muskrat dens, but usually when the Indians took food from animals, they left some other edible food in place of that which they "borrowed." Most tribes believed that it would be dangerous to invite the vengeance of animals by stealing their food and leaving them hungry. The starchy rootstocks were also sometimes ground into flour for making cakes or porridge. Medically, this plant was sometimes used as a substitute for *Nymphaea odorata*, as it has the same medicinal properties.

There is some question concerning whether this subspecies actually occurs in Delaware County. To date the only record of this taxon in that county is an observation of Stanley Smith in the stream of the gorge below Grand Gorge, an observation which, in view of the distribution of the Large Yellow Pond-lily elsewhere in the state, is definitely in need of confirmation; the writer has not yet been able to locate it near Grand Gorge.

Nùphar lùteum (L.) Sibth. & Son. ssp. *pùmilum* (Timm) Beal. Small-leaved Spatterdock.

Meaning of Species Name. Yellow; ssp. name, small.
Synonyms. *N. microphyllum* (Pers.) Fern. in Fernald (1950) and in Gleason (1952).
Type of Plant. A perennial aquatic herb.
Habitat. Pond margins, deadwaters, and slow streams.
Range. Nf to Man, s to NJ, Pa, Mich, Wis, and Minn.
Distr in NYS. Infrequent but widely distr across the state northw; less frequent westw and southw, and absent from the s part of LI.
Distr in the Torrey Range. Known in our range only from ponds and lakes n of the moraine; frequent in the Bronx r.
Time of Fl. Jun-Oct; Jul-Aug at Cornell.
Origin. Native.
Remarks. This subspecies flowers later than the preceding one.

Nùphar lùteum (L.) Sibth. & Son. ssp. *variegàtum* (Engelm.) Beal. Bull-head Pond-lily.

Meaning of Species Name. Yellow; ssp. name, variegated.
Synonyms. *N. variegatum* Engelm. in Fernald (1950) and in Gleason (1952).
Other Names. Northern Yellow Pond-lily.
Type of Plant. A perennial aquatic herb.
Habitat. Pond margins, slow streams, and pools.
Range. Nf and Que to BC, s to NJ, Del, Md, O, Ind, Ill, Ia, Neb, SD, and Mont.
Distr in NYS. The prevailing form throughout all of e, c, and n NY.
Distr in the Torrey Range. This variety, with floating leaves, is perhaps the commonest of all.
Time of Fl. May-Sep; Jun-Aug at Cornell.
Origin. Native.
Remarks. This in its typical form always possesses floating leaves.

The rootstocks of this, as well as ssp. *macrophyllum*, can also be boiled or roasted and, in areas where they are abundant, can make a welcome addition to the menu on a camping trip. Johnston (1970) reports that several tribes of the northwestern Great Plains used the fleshy rhizomes as food. In addition he states that "The dried rhizomes were powdered and applied to wounds as a styptic by the Sioux." There is evidence that the Iroquois regarded this plant as "strong medicine," for Herrick (1978) states that they considered it effective in the treatment of insanity and that it would "Cure paralysis, dizziness, convulsions, epilepsy, or alcoholism" as well as "vague internal pains; swellings; sore eyes; blindness; cysts, boils, pimples, and piles." In addition, it was "thought to be effective in curing or preventing certain severe, English-named diseases," such as smallpox, cancer, tuberculosis, and syphilis.

Berglund and Bolsby (1971) suggest washing the roots well then scraping with a knife to remove all the black spots before wrapping them with meat in aluminum foil and baking them in the hot embers of the campfire for a couple of hours. They can also be put in the hot coals in the morning and left all day. Some people find the flavor of the roots rather strong; this can be remedied either by parboiling in two changes of water or by seasoning. The seeds can also be popped like popcorn. Simply remove the seeds from the their pods, wrap in aluminum foil, and place them close to the fire. The familiar popping sound will indicate when they are done. The addition of some butter or other fat will enhance their flavor. It must be remembered, however, that in New York State this species is on the protected list as a rare and endangered species; it should therefore be treated accordingly.

Nymphaèa L. Water-lily.

These plants are true aquatics, growing with their roots in soil and their leaves floating on the surface of the water. The name of the genus is derived from the ancient Greek name for water-nymphs, alluding to the habitat in which these plants grow. The flowers of some kinds float, those of others are carried on stout stems well above the water. About 40 wild species are known, chiefly tropical, but also natives of the northern hemisphere, Australia, and South Africa. From these wild species horticulturists have developed a large number of hybrids, which are the ones most commonly grown in gardens. Horticulturally, this genus is the most important group of all aquatic plants, producing showy flowers of white, pink, yellow, and blue.

For garden purposes, species of this genus can be divided into two separate classes: the tropical kinds, which have tubers and carry their flowers well above the water; and the hardy varieties, which have fleshy rhizomes and flowers that normally float on the surface of the water. The hardy water-lilies are among the easiest of plants to grow; among those that occur naturally wild in some parts of the world, as distinct from the improved or hybrid kinds developed by horticulturists, a number are worth growing in gardens. These include the European White Water-lily, *Nymphaea alba*, a vigorous grower, with leaves up to 12 inches across that are reddish when young and white flowers that measure 4 to 5 inches in diameter. Our native species, the Fragrant Water-lily, *N. odorata*, also makes an attractive ornamental for planting in ponds.

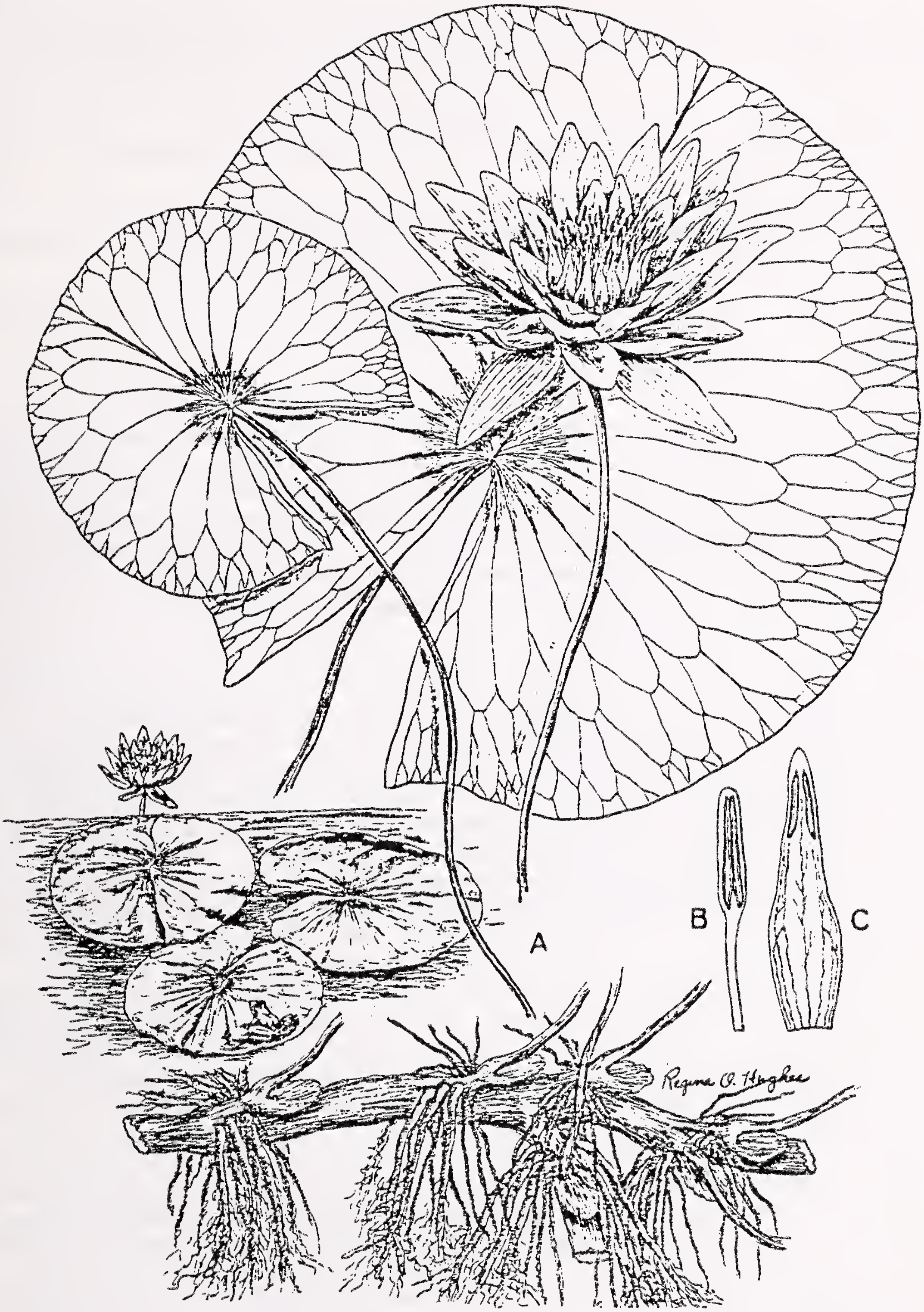
Several old world species of *Nymphaea* have long been used for food. In Africa the starchy rootstocks of some species are still boiled or roasted, while the seeds are cooked whole or ground into flour. The porous seed stalks of N. gigantea, the Australian Water-lily, are peeled and eaten either raw or roasted. The large tubers are also utilized, being described as "not unlike potatoes" when roasted, "being yellow and dry when cooked." In India and Ceylon the starchy rootstocks of N. lotus, the Egyptian Water-lily, are eaten by the poorer classes, and the "small seeds are fried in heated sand and make a light, easily digestible food." Both capsules and seeds are also "either pickled or put into curries or ground and mixed with flour to make cakes." In the upper Nile region both the flowers and roots of a native species are eaten. In France the rootstocks of the native N. alba were once used in the preparation of a kind of beer.

In Europe this species also played a part in medicine, for the U.S. Dispensatory of 1865 states that "The root of N. alba ... was esteemed antaphrodisiac by the ancients but has long lost this reputation, but it may have been useful by its astringency in some cases of leucorrhea, gonorrhea, dysentery, and similar ailments, in which it was formerly employed for its reputed sedative virtues."

In Scotland a black dye was obtained from the same species. Winifred A. Shand, in Dye Plants and Dyeing (1964), describes how women of the Outer Hebrides gather the rhizomes for use in dyeing: "With water-lily (Nymphaea alba), used for dyeing black, the 'roots'--that is to say the thickened rhizomes--must be gathered in summer when the lochs are shallow, so the dyer can reach them. Having located a rhizome with one's toes, for they are well imbedded in the mud at the bottom, one has to break the sucker roots which hold it down, taking care not to break the rhizome, as it 'bleeds,' and much of the dye is then lost. This means 'guddling' with one hand and arm below the surface, one's face on a level with the water, and feeling one's way, for the silt gets all stirred up. This process disturbs all the midges and clegs (the Scottish horse-fly), which promptly set out to attack the gatherer. One wants to gather the largest possible pieces, but if the summer has been wet, only young rhizomes can be reached, and these produce only a pale gray." To make a black dye, the roots were scrubbed and scraped until clean then pounded with a wooden beater until soft. The roots were then boiled and the liquid strained to make a dye bath in which the wool was boiled until it was a rich brown in color. Copperas was added for final boiling.

Moose make water-lily pads a principal item of diet, and beavers, porcupines, muskrats, and deer feed on various parts of these plants. The seeds are utilized by various species of wildfowl, but Martin et al. (1961) state that only in the Gulf region are the seeds important as duck food.

Until quite recently it was thought that there were two species of Nymphaea native to New York State, N. odorata and N. tuberosa. Among other differences N. odorata was supposed to have smaller, much more fragrant flowers, purple petioles, and leaves that were purple on the under side, while the leaves of N. tuberosa were supposed to be "mainly green, with only a slight purplish tinge" and a green petiole "striped above with brown." Close study of the two supposed "species," however, has revealed that no single character or group of characters could be relied upon to distinguish between them and that only one polymorphic species is involved--N. odorata. Mitchell and Beal (1979) state that this is "A genus of highly variable plants," adding that "The most recent treatment ..., supported by subsequent experimental evidence ..., recognizes one species throughout North America and Europe ..."



Nymphaea odorata--Fragrant Water-lily
[From USDA Agr. Research Sv. (1971), Fig 86, p. 177.]

Nymphaèa odoràta Ait. Fragrant Water-lily.

Meaning of Species Name. Fragrant.
Other Names. Fragrant Pond-lily, Sweet-scented White Water-lily, Pond-lily, Water Nymph, Water Cabbage. Toad-lily, Sweet Water-lily, White Water-lily.
Type of Plant. A perennial aquatic herb.
Habitat. Quiet waters of ponds, lakes, streams, and bog-pools (where often dwarf).
Range. Nf to Man, Minn, and Mich, s to Fla and Tex.
Distr in NYS. Frequent or common throughout most secs of the state, but locally absent from secs where such waters do not occur.
Distr in the Torrey Range. Common throughout the area.
Time of Fl. Jun-Sep; Jul-Aug at Cornell.
Origin. Native.
Remarks. A very variable species.

Rafinesque (1828-30) has quite a bit to relate concerning the uses of this native plant: "The fresh leaves ... are eaten by cows and cattle, and in Canada they are eaten in the spring, boiled for greens." The flower buds are also reported to have been cooked and relished by the Ojibwa Indians. In addition, Rafinesque remarked that "The roots ... dye of a dark brown and black colour with iron ...," concerning which another authority stated that "the goods thus dyed retain[ed] their color admirably."

The Indians made use of this plant in medicine, for Millspaugh (1892) stated that "The roots, in decoction, were much esteemed by Indian squaws as an internal remedy, and an injection or wash for the worst forms of leucorrhoea, its properties in this direction being due to its great astringency. The macerated root was also used as an application in the form of a poultice to suppurating glands; its styptic properties were also fully known and utilized." Rafinesque was of the opinion that the medicinal properties of this species were "Similar to those of N. alba of Europe, but much more efficient and decided. The roots are chiefly used and are kept in shops in New England." He called them "astringent, refrigerant, demulcent, anodyne, hypnotic, emollient, ... &c." Taken internally, he considered the roots "useful in diarrhoea, dissentery, gonorrhea, leucorrhea, scrofula, and many fevers." The fresh leaves were likewise deemed "excellent for cooling and emollient cataplasms," while "The fresh juice of the roots, mixed with lemon juice, is said to be a good cosmetic, and to remove pimples and freckles of the skin." Other sources state that an infusion was used as a gargle for ulcers in the mouth and throat, while a tea made from the root was considered a good remedy for diarrhea.

This species bears along its rootstock egg-shaped or rhomboid brown tubers up to 3 or 4 inches long. These can be broken off by wading among the plants late in the season, when they will float to the surface in great quantity. In view of the general use of tubers and seeds of African members of this genus, those of our own should be investigated as an emergency food in wilderness areas. In 1905 Conrad summarized African uses as follows: "... on the West Coast of Africa, Nymphaea seeds constitute an important article of food. Travelers describe seeing the native women and children coming in at evening to the villages laden with the ripening fruits. These are laid in heaps until all of the soft parts decay. The seeds are then easily washed out clean, and are dried and stored away. They contain so much starch, oil, and proteid that they should form a very nutritious diet. When dry the seed coat is brittle and the kernel slightly shrunken, so that the two are easily separated. The kernels may be ground into a kind of flour or may be boiled whole. The resting tubers, in the dry season, are almost solid starch, and are eaten boiled or roasted like potatoes.... In Central America also water-lily seeds are used for food." It must be remembered, however, that in New York State this species is also on the list of protected plants.

According to one report, this species was grazed by hogs after a pond had been drained, resulting in severe illness followed by death.

MAGNOLIÀCEAE, the Magnolia Family

Cronquist (1968) places this family in the order Magnoliales, along with 18 other families, only 4 of which (Magnoliaceae, Annonaceae, Calycanthaceae, and Lauraceae) are represented in the northeastern flora. This order, as noted above, forms part of his subclass Magnoliidae, of which "most of the families ... are primitive as compared to other angiosperms." Those families "generally regarded as being the most primitive ... are woody plants with spherical ethereal oil cells." The Magnoliales are considered as being the "ancestors or near-ancestors to the rest of the angiosperms," but "Each of these families has evolved slowly, independently of the others, and now presents a mixture of primitive and more advanced characters."

This family, as traditionally conceived, contains 10 genera and over 100 species of deciduous or evergreen trees or shrubs, primarily of temperate regions of the northern hemisphere. The Magnoliaceae are characterized in part by the presence of large single bisexual flowers made up of numerous stamens and usually numerous simple pistils, both spirally arranged on an elongated axis or torus. Economically the family is important for the 20 species of Magnolia cultivated domestically as ornamentals and for the wood of the Tulip-tree and that of several species of Magnolia used in furniture and for cabinet work.

Liriodéndron L. Tulip-tree.

There are two species of Liriodendron, both deciduous trees, ours and one from China. The name of the genus is derived from the Greek lirion, a lily, and dendron, tree, referring to the flowers. The Chinese Tulip-tree was introduced into this country during the early years of the present century. It seems to grow as well as the American species and is very similar in appearance, but the flowers are a little smaller; some botanists therefore feel that it may not be a distinct species.

Liriodéndron tulipífera L. Tulip-tree.

Meaning of Species Name. The old generic name, meaning tulip-bearing.
Other Names. Tulip-poplar, Yellow Poplar, Lime-tree, Whitewood, Cucumber-tree, Blue Poplar, White Poplar, Lynn-tree, Saddle-tree, Hickory-poplar, Basswood, Saddle-leaf, Canoe-tree, Tulip Magnolia, Popple,

Canoe-wood, Tulip.

Type of Plant. A tall tree, sometimes 150 ft high with a trunk 8-12 ft in diameter, but more often only 80-100 ft tall with a trunk 2-5 ft thick.

Habitat. Rich soil, especially of lowland woods.

Range. Ct to s Mich, Wis, and Mo, s to Fla and La.

Distr in NYS. Across the state s of the Adirondacks; rare or absent from the more elevated portions of the Catskill reg and from the higher upland woods extending from Albany co westw to s Onondaga co; occasional in the Mohawk valley and common in the lowlands about Oneida L and westw; southw in the state of more uniform and general distr.

Distr in the Torrey Range. NY: Common on the n side of LI; on SI and s of the highlands in the Hudson valley, thence decreasing northw; rare or wanting as a wild tree in Greene co: Copake Falls, Columbia co.

Elevation. Sea level-1000 ft in the Torrey range.

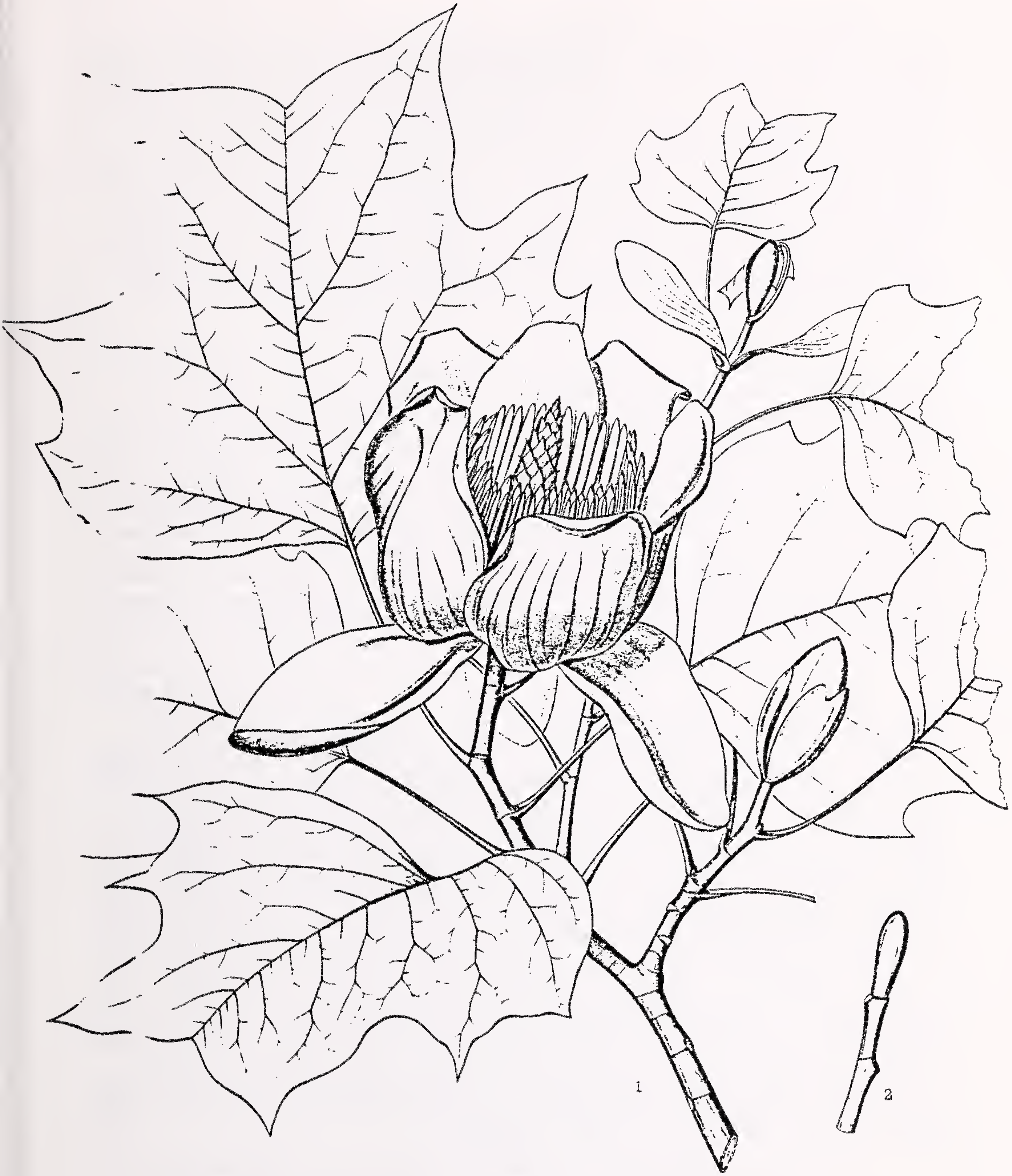
Time of Fl. May-Jun; Jun 1-20 at Cornell.

Origin. Native.

Remarks. Often planted as a street tree and much valued for its light wood, 28 lb per cu ft, dry wt.

This tall, stately North American forest tree, closely related to the magnolias, is one of our tallest and most handsome hardwood trees. It is reported to grow taller than any other hardwood tree in North America, in some areas reaching a height of 200 feet. In the forest it develops a straight, slightly tapering trunk clear of branches for a great distance from the ground. While it prefers a deep rich moist soil and is commonly found on bottomlands, it also occupies rocky slopes of the mountains. It attains its maximum size and abundance from Virginia and the lower Ohio valley southward. The older trees have deeply furrowed bark and large smooth leaves, characteristically truncate or broadly notched at the apex. The conspicuous flowers, about 2 inches high, appearing in June after the leaves are fully developed, have three sepals and six yellowish-green petals with orange spots at the base. Their fancied resemblance to tulips has given the tree its common name. The flowers are followed by a conelike fruit bearing terminally winged samaras. These cones disintegrate at maturity, leaving a naked axis that often persists through the winter. This tree has a bewildering number of common names, of which the most unfortunate are perhaps Yellow Poplar (or Yellow Popple) and Basswood, both of which are inappropriate, for it has no relationship to either Populus or Tilia. The lumberman's Tulipwood refers to a tropical cabinet wood, however, so he most likely regards the foresters' preference for the name Tulip-tree as one of their idiosyncrasies.

Harlow (1957) provides an illuminating discussion not only on the distribution of this tree but of others as well: "Before the last ice age, one or more species were found in Europe as well as the one here. As the ice pushed slowly southward, the European trees were wiped out because of the great east and west mountain barriers and the Mediterranean sea. But in America, the Appalachians run north and south, and trees by seeding slowly southward were able to 'move' before the ice front. When the ice retreated, the trees moved northward again. This story explains why we have so many more kinds of trees in the eastern United States and Canada than are found in Europe."



Liriodendron tulipifera--Tulip-tree
[From Sargent (1891-1902), Vol. I, Plate 13, p. 20.]

Because of its stately beauty, the Tulip-tree makes a most desirable street, shade, or ornamental tree, much appreciated in Europe since colonial times. More and more it is becoming more highly regarded at home as a desirable lawn and shade tree, for there is no time in the year when it is not full of interest and beauty. As Peattie (1950) so well put it, there is "something joyous in its springing straightness, in the candle-like blaze of its sunlit flowers, in the fresh green of its leaves, which, being more or less pendulous on long slender stalks, are forever turning and rustling in the slightest breeze; this gives the tree an air of liveliness lightening its grandeur." In autumn the leaves turn a rich gold. Even in the dead of winter the tree is still adorned, for remnants of the cones remain, candelabrum fashion, erect on the bare twigs after all the seeds have fallen, faded and shining almost white against the dark branches.

The winter twigs are set with oblong, blunt leaf buds, the terminal one containing the flower if the tree is old enough to bloom. The unique development of the leaves, unmatched in the world of trees as they unfold in spring, is a delight to watch. The terminal buds of saplings best show the peculiarity of the tree's vernation, so well described by Rogers (1926): "Two green leaves [stipules] with palms together form a flat bag that encloses the new shoot. Hold this bag up to the light and you see, as a shadow within, a curved petiole and leaf. The bag opens along its edge seam, the leaf-stem straightens, lifting the blade which is folded on the midrib. At the base of the petiole stands a smaller flat green bag. As the leaf grows to maturity the basal palms of its protecting bag shrivel and fall away, leaving the ring scar around the leaf base. Now the growing shoot has carried up the second bag, which opens and another leaf expands, sheds its leafy stipules, and a third follows."

This is a valuable timber tree, furnishing a yellowish, light, fine-grained, compact wood known as yellow-poplar or whitewood; it is a very easily worked, soft, brittle, and weak but straight-grained wood. Although classed as a commercial "hardwood," it is actually softer than any softwood in North America except for Western White Pine and Alpine Fir. Michaux (1851) provides an interesting account of the place occupied by this species during the first half of the last century: "At New York and Philadelphia, and in the adjacent country, the Poplar [Liriodendron] is often employed, in the construction of houses, for rafters and for the joists of the upper stories, for which purposes it is esteemed on account of its lightness and strength. In the other Middle States, in the upper parts of the Carolinas, and above all in the Western States, it is more generally used in building, and is considered as the best substitute for the Pine, the Red Cedar and the Cypress. Wherever it abounds it serves for the interior work of houses, and sometimes for the exterior covering ... The panels of doors, and of wainscots, and the mouldings of chimney-pieces are made of Poplar. In the States of Ohio and Kentucky ... and in the upper part of North Carolina, Poplar shingles about 15 inches long are preferred for covering roofs, because they are the most durable, and because they are not liable to split by the effect either of intense frost or of ardent sunshine.

"In all the large towns in the United States, Tulip Tree or Poplar boards, which are often 2 or 3 feet wide, are exclusively used for the panels of coaches and chaises. When perfectly dry, they receive paint well, and admit of a brilliant polish.... The seat of Windsor chairs, which are fabricated at New York, Philadelphia and Baltimore ... is always Poplar; a larger quantity of the wood than would be supposed is consumed in this way, and also in the manufacture of trunks which are covered with skins, and of bedsteads, which are stained in imitation of mahogany.... as it is easily wrought in the lathe, and is very light, it is much used for wooden bowls: it is also preferred for the head of hair brooms and sweeping brushes. The farmers choose it for the eating and drinking troughs of cattle; these troughs are formed of a single piece, and exposed to the weather they last as long as those made of Chestnut and of Butternut.... The Indians who inhabited the Middle States, and those who still remain in the western country, preferred this tree for their canoes, which, consisting of a single trunk, are very light and strong, and sometimes carry twenty persons. In fine, the Poplar affords excellent charcoal, which is employed by smiths in districts that furnish no fossil coal.... It is very cheap, being sold at half the price of Black Walnut, Wild Cherry and Curled Maple."

In more contemporary times it has also proved valuable as an insulating material, against sound as well as heat and cold. Though fairly flexible and tough, it is not strong as a beam or column, but its easily worked wood is useful for many purposes, including furniture, where its ability to take glue makes it an ideal core for veneers of more expensive woods, such as mahogany and walnut. Unfortunately, even very young trees are now cut for pulp, since by the soda process its wood can be made into high-grade book paper; even ordinary postal cards are made from it. This tree never had such a spectacular history as the White Pine, but the drain upon supplies of it have been long and great. Peattie (1950) reports that in 1940 the total cut of yellow-poplar lumber in the United States amounted to more than 376,000,000 board feet, at the mill valued at $17,000,000; it is not surprising, therefore, that supplies have since dwindled almost to the vanishing point.

The early settlers seem to have been more impressed by the medical properties of this tree than were the Indians, for most tribes made only casual use of it. The Catawbas used a preparation of the root bark to expel worms. Indians west of the Mississippi used an infusion of the root bark in the treatment of intermittent fevers, while the seed balls were administered to children to destroy worms. The early colonists, on the other hand, used this species in a variety of ways. John Lawson, writing in 1714, declared that an ointment made from the crushed buds of this tree could cure scalds, inflammations, and burns, while the juice was used to cure yaws. Peter Kalm, writing in the 1750's, reported that the crushed leaves were used as a poultice on the forehead to cure headache and that the pounded bark in dry form was fed to horses to expel worms; he also observed that "Many people believe its roots are as efficacious against the fever as Jesuit's bark." Dr. Schoeph, a Hessian physician of the Revolutionary War who later elected to remain in America, called the bitter root bark a febrifuge and stated that, infused in wine, it was used in the treatment of intermittents as well as for rheumatism and arthritis, although in 1810 Dr. Benjamin Barton questioned the validity of its reputation as a remedy for gout and rheumatism. Dr. Jacob Bigelow, also writing during the early 1800's, described the bark as a stimulating tonic and diaphoretic.

The U.S. Dispensatory of 1865 still called Liriodendron "a stimulating tonic, with diaphoretic properties," which "has been used as a substitute for Peruvian bark in intermittent fevers, and has proved serviceable in chronic rheumatism, dyspepsia, and other complaints in which a gently stimulant and tonic impression is desirable." Both an infusion and decoction of the root bark were used, prepared in the proportion of an ounce of the bark to a pint of water, and given in the quantity of 1 or 2 fluid ounces. The bark was taken indiscriminately from the root, trunk, and branches, but it was thought that the root bark was the most active. Tulip-tree bark, at once bitter and aromatic, was official in the U.S. Pharmacopeia, 1820-82, for use as a stimulating bitter tonic, antiperiodic, and diuretic. Tulipiferine from the inner bark also reportedly exerts powerful effects on the heart and nervous system and was used as a heart stimulant. The root was also used to prepare an "agreeable liquor," and the Canadians are reported to have used the root to correct the bitterness of spruce beer and to give it a lemony flavor.

Colonial housewives also discovered that Tulip-tree leaves would produce, with a chrome mordant, an attractive gold color on wool, but that it was unsatisfactory on cotton. To dye 1 pound of wool, 1 1/2 pecks of fresh leaves were shredded, covered with water, and left to soak over night. The following morning they were heated to the boiling point and simmered for 20 to 25 minutes. When cool enough to handle, the leaves were strained out and enough cold water was added to make a dyebath of 4 to 4 1/2 gallons. The mordanted wool was next thoroughly rinsed, and excess water was squeezed out before immersing it in the dyebath, which was again heated to the boiling point and boiled for 20 to 30 minutes, after which the wool was rinsed and hung out to dry.

Bees make quantities of honey from the blossoms of the Tulip-tree, but the seeds, in a good seed year cast in large numbers from the conelike fruits that ripen in the fall, are of only moderate significance to wildlife. They are eaten by several species of birds (notably the purple finch and the cardinal). The fruits also provide some food for squirrels and other small animals, while white-tailed deer often browse on the twigs. Some of the seeds persist in the cones through the winter, however, and are therefore of special value in early spring when other food may be scarce.

LAURÀCEAE, the Laurel Family

This is a family of chiefly tropical forest trees or shrubs with about 45 to 50 genera and more than 1100 species. They are mostly native in tropical southeastern Asia (Australia to Japan) and paleotropical America; species of two genera extend to Canada. Economically the family is important for the aromatic oils that are responsible for the fragrance of many of its members. Among all the products of this varied family, the West Indian Avocado Pear is the only one cultivated for food, having become a major fruit industry in the southern states. Other important products derived from members of this family include the leaves of the true Laurel or Sweet Bay, Laurus nobilis, which are dried to furnish the familiar bay leaves used as a condiment for flavoring soups and stews: camphor is obtained from the Camphor Laurel, Cinnamomum camphora, a tree found in Japan, Formosa, and China; and Cinnamomum zeylanicum, a tree native to Ceylon, furnishes cinnamon, a spice used both as a condiment and a flavoring agent. Other species supply fragrant woods used in cabinet work, and some are cultivated for ornament.

Key to Catskill Genera of the Lauraceae

1. At least some of the leaves with 1-3 lobes, with 3 main nerves arising near the base of the leaf blade; young twigs yellow-green; flowers and fruits appearing only at the tips of the branches, in loosely stalked clusters; flowers 8-10 mm broad, usually appearing with the young leaves........................ Sassafras
1. None of the leaves lobed, all simple, pinnately veined with 5-7 pairs of nerves along the midvein; young twigs some shade of brown; flowers and fruits appearing along the sides as well as at the tips of the twigs, in nearly sessile round clusters; flowers 5 mm broad, appearing before the leaves come out.. Lindera

Líndera Thunb. Spicebush.

There are about 60 species of Lindera, evergreen and deciduous trees and shrubs. Only one species is found wild in North America; the others are native to eastern and southern Asia. They have honey-yellow flowers in almost sessile lateral umbel-like clusters, in our species appearing before the leaves. The genus was named to honor Johann Linder, 1676-1723, an early Swedish botanist. Three species from eastern Asia are cultivated domestically in addition to our native one.

Líndera benzòin (L.) Blume. Spicebush.

Meaning of Species Name. An old name for some member of the Lauraceae.

Other Names. Benjamin-bush, Spice-wood, Snap-wood, Snap-weed, Fever-bush, Wild Allspice.

Type of Plant. A deciduous aromatic shrub growing 4 to 15 or 20 ft high.

Habitat. Rich moist woods, wooded swamps, and brooksides.

Range. Me to Ont, Ill, and Mich, s to NC, Ky, Mo, and Kan.

Distr in NYS. Frequent or common across the state from L Champlain and L George to Lewis and Jefferson co, westw to L Erie and southw except in the pine barrens of LI.

Distr in the Torrey Range. Throughout the area except in the pine barrens, there wanting.

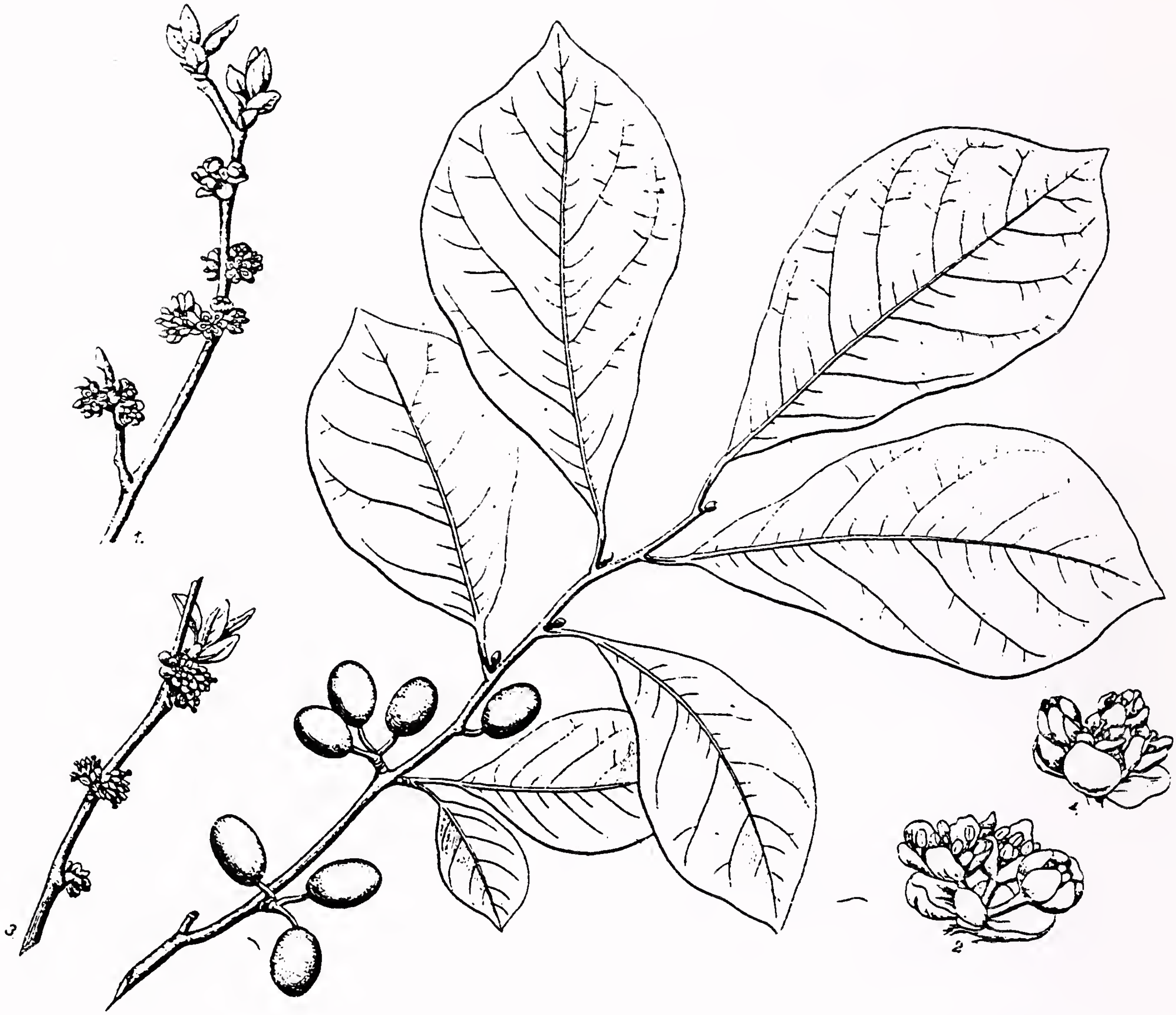
Elevation. Grows to 2500 ft in Va.

Time of Fl. (Mar)Apr-May, fr Aug-Sep; fl Apr 20-May 10 at Cornell.

Origin. Native.

Remarks. Still in current demand as a drug plant.

This eastern North American species, related to Sassafras and Oregon Myrtle, grows as an understory shrub in moist woods. It usually bears either yellow staminate or pistillate flowers; the latter mature fruit in late summer. The dried and powdered berries of this plant were used during the Revolutionary War as a substitute for allspice, hence Wild Allspice as one of its common names. The crushed fruit was at one time also used to adulterate powdered cloves. The spicy aromatic twigs, leaves, and fruits were likewise much used by Confederate soldiers as a substitute for tea.



Lindera benzoin--Spicebush
[From Emerson (1878), Vol. II, plate facing p. 365.]

This species was also used in medicine, for the U.S. Dispensatory of 1865 states that "The small branches are sometimes used as a gently stimulating aromatic, in the form of infusion or decoction. They are said to be employed in this way by the country people as a vermifuge and as an agreeable drink in low fevers; and the bark has been used in intermittents." Somewhat later Millspaugh (1887) remarked that "In domestic practice the bark, leaves, and berries have been used in decoction to produce diaphoresis, and act as a febrifuge; they were considered also as tonic, stimulant, antiperiodic, and anthelmintic," to stimulate blood circulation, increase perspiration, treat dysentery, coughs, and colds, and to expel intestinal worms. The oil of the berries was often used in the treatment of neuralgic and rheumatic pains. Grieve (1967) states that "A tincture prepared from the fresh young twigs before the buds have burst in spring is still used in homeopathy, but no preparation is employed officially."

Steyermark (1963) suggests that "The bright red fruits of the pistillate shrubs and the bright masses of yellow flowers appearing before the leaves in early spring, especially showy on the staminate shrubs, make the Spice Bush a plant of ornamental value, particularly in shaded areas or for naturalizing in shrub borders or woodland."

Martin *et al*. (1961) state that "The reddish fruits, containing a single large seed, are relished by thrushes, particularly by the wood thrush and veery, but are eaten only sparingly by other birds."

Sássafras Trew. Sassafras.

There are three species of *Sassafras*, two being native to eastern Asia. The name of the genus is by some considered to have been adapted from the Spanish vernacular name *salsafras*; other authorities state that it is an aboriginal name applied by the early French settlers in Florida. They are deciduous trees with spicy-aromatic bark and very mucilaginous twigs and foliage. The greenish-yellow flowers grow in corymbose racemes, appearing with the leaves.

Sássafras álbidum (Nutt.) Nees. Sassafras.

Meaning of Species Name. Whitish, referring to the undersides of the leaves.

Other Names. White Sassafras, Ague-tree, Cinnamon-wood, Saloop, Smelling Stick, Saxifrage-tree, Sassafac.

Type of Plant. A small tree, sometimes attaining a height of 80 ft and a trunk 6 ft in diameter, but usually only 20-40 ft high with a trunk 1-2 ft in diameter.

Habitat. Dry or rich woods, thickets, roadsides, and old fields.

Range. Me, NH, Vt, and Ont to Mich, s to Fla and Tex.

Distr in NYS. Locally common across the state outside the Adirondack reg but absent from the higher Catskills and from most of the hills and limestone reg from s Albany co westw; very common in the sand plains between Albany and Schenectady, e and n of Oneida L, and throughout the Ontario lowlands; very common on LI and SI.

Distr in the Torrey Range. Common throughout the range.

Time of Fl. Apr-May(Jun), fr Jul-Aug; fl May 20-Jun 10 at Cornell.

Origin. Native.

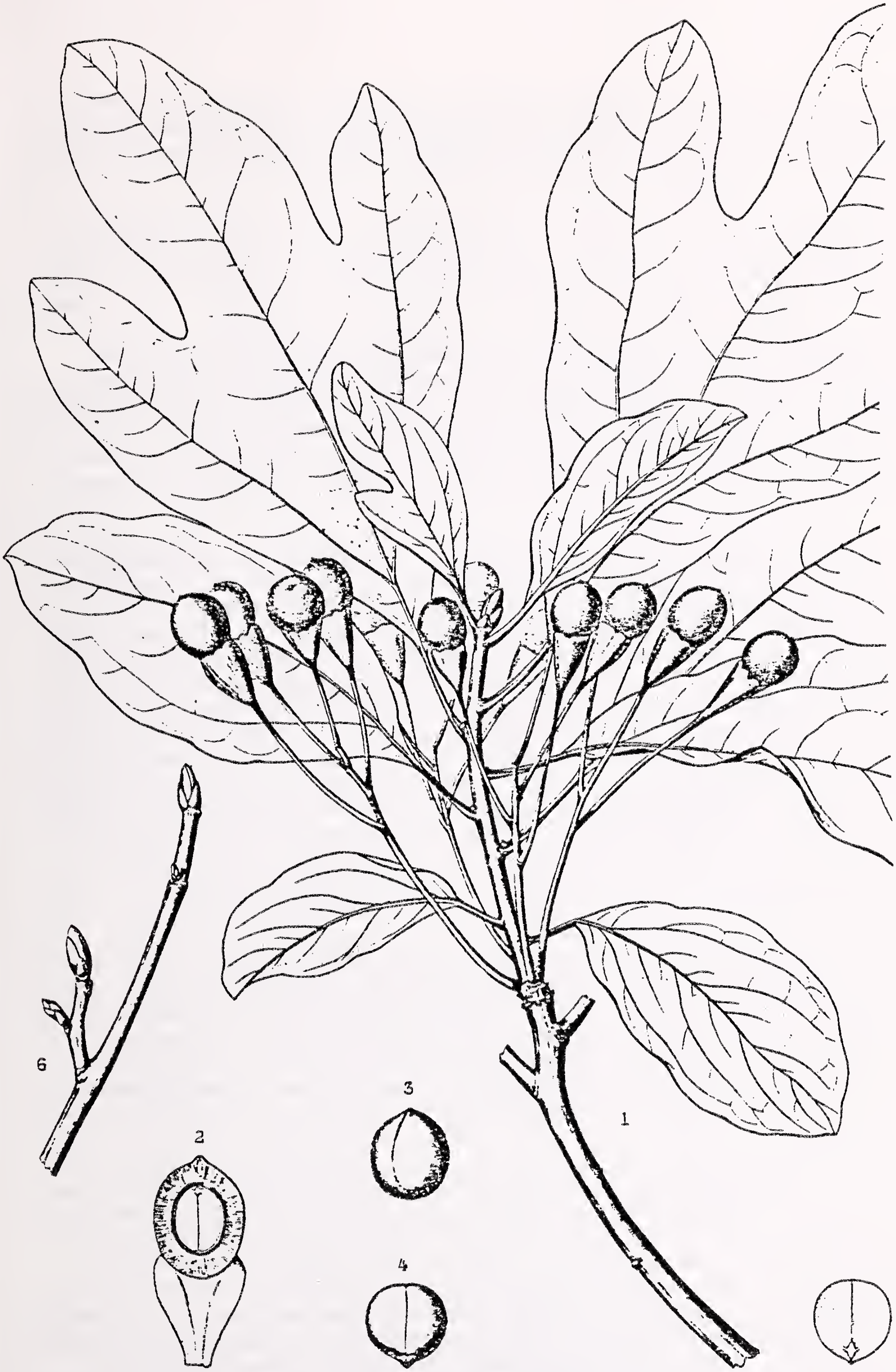
Remarks. Wood soft, weak, brittle, durable; wt 31 or 32 lb per cu ft.

Until comparatively recently, when two species were discovered in eastern Asia, one in China and one in Formosa, this species, familiar as a roadside tree in many areas, was considered the sole remnant of an ancient genus. Fossil leaves of Sassafras are preserved in arctic regions and in the rocky strata of our western mountains, as well as in Europe, giving proof that the genus once had a much wider range than it now does. It is a small tree of eastern North America with aromatic bark and foliage, furrowed bark, bright green twigs, and entire, mitten-shaped, or three-lobed leaves, the three forms often growing on the same twig. Its yellow flowers, borne in small clusters, are followed by dark blue berries. It grows along fencerows and roadsides, often invading abandoned fields, preferring a fairly fertile soil. Its uniquely shaped leaves and the characteristic spicy flavor of the twigs make it easy to identify with certainty, for nothing in our flora, except the White Mulberry, has mitten-shaped leaves, but those of the mulberry are sharply toothed while Sassafras leaves have smooth margins. It is during the fall, perhaps, that the Sassafras is most striking, with its leaves turning yellow, orange, blood-orange, or even salmon pink, sometimes blotched with bright vermillion against the bright blue of an October day. The deep blue fruits on thick, bright red stalks complete the contrast, producing an effect which few trees anywhere can surpass, making it an attractive ornamental tree. It is said to be difficult to transplant, but it grows readily from seed. One authority, however, states that "root cuttings bear transplanting as easily as poplar."

Sassafras was used in some way by virtually all Indians living within its range, both as a tea and as a medicinal plant. Vogel (1970) reported that both the Iroquois and the Delawares used the berries for medicine. Among other tribes the bruised leaves were applied as poultices, the pith of young sprouts was steeped for an eyewash, and the bark of the dried root was smoked like tobacco. Both the Rappahannocks and the Houma Indians made an infusion of the roots, either fresh or dried, to treat measles and scarlet fever, while the Creeks boiled the roots with a grass to make a warm drink administered to patients with pains in the stomach or bowels. Seminole Indians used Sassafras to treat coughs, gallstones, and bladder pains.

Sassafras was one of the plants that attracted considerable attention among Europeans from the time of its first discovery by the Spaniards when they conquered Florida in 1538. They mistook the scent of Sassafras for Cinnamon, a spice that grows in Ceylon, and soon established a trade in this product. John Lloyd, writing in 1898, did not exaggerate when he wrote that "this tree at one time created greater interest in the Old World than any other American product, not excepting tobacco." Its reputation was launched in 1574 by a "physician of Seville"; he wrote a book that was translated into English in 1577 under the title The joyful news from the West Indies. That book praised Sassafras as a sovereign remedy in the treatment of malaria and other fevers, complaints of the liver and stomach, "griefes of the breast caused of cold humours, griefs of the head," and for "them that bee lame and creepelles and them that are not able to goe." In a day when almost no disease was correctly understood either as to its cause or its treatment, such a panacea was certain to raise high hopes, and it was perhaps easier to believe in a highly aromatic Indian cure-all from the new world than to rely on the then current methods of treatment, particularly since they did not always meet with complete success.

When Bartholomew Gosnold explored Cape Cod, Martha's Vineyard, and the Elizabeth Islands in 1602, Sassafras was found growing in "great plenty" on one of the islands, so the crew, with the help of a number of Indians, collected a large quantity of it to take back to England. It would therefore appear that Sassafras was the first plant product to be exported from New England. Gosnold was influential in securing charters for the London and Plymouth companies in 1606. At a price of 3 shillings per pound at that time, there can be little doubt that Sassafras played a part in the formation of those companies, established primarily for commercial profit. Not only was Sassafras one of the first exports sent to England from the Jamestown colony in Virginia, but the first cargo shipped by the colonists of Massachusetts contained a large consignment of Sassafras roots. Bark of the Sassafras tree was listed in the Pharmacopoeia Londinensis of 1618 and then



Sassafras albidum--Sassafras
[From Sargent (1891-1902), Vol. VII, Plate 305, p. 18.]

ranked with tobacco as a principal export of Virginia. The bulk of the shipments went to England for use in treating colic, pain, venereal disease, and a number of other ailments, including gallstones, measles, and scarlet fever, as well as for a tonic to "thin the blood."

In New England John Josselyn considered the root chips, boiled in beer, "excellent to allay the hot rage of feavers." Dr. Benjamin Barton in 1810 considered oil of sassafras an excellent external application in the treatment of rheumatic and gouty affections, and Samuel Stearns called the wood, root, and bark stimulant, aperient, diuretic, diaphoretic, and corroborant, useful in the treatment of "scorbutic, venereal, cachetic, and catarrhal disorders." Dr. Jacob Bigelow, writing a decade later, however, felt that the virtues of Sassafras had been exaggerated and asserted that it had "fallen into deserved oblivion" for treating rheumatism, dropsy, and especially syphilis, and stated that "it is now recognized only with regard to its general properties, which are those of a warm stimulant and diaphoretic."

The pith of the twigs also had medicinal uses, for the U.S. Dispensatory of 1865 states that "The pith abounds in a gummy matter ... much employed as a soothing application in inflammation of the eyes. It also forms an agreeable and useful drink in dysenteric, catarrhal, and nephritic diseases. It can be prepared by adding a drachm of the pith to a pint of boiling water." But the root bark was the official part. In 1865 it was considered "stimulant and perhaps diaphoretic," used "almost exclusively as an adjuvant to other more efficient medicines, the flavor of which it improves, while it renders them more cordial to the stomach. The complaints for which it has been particularly recommended are chronic rheumatism, cutaneous eruptions, and scorbutic ... affections." The dried root bark was official in the U.S. Pharmacopeia, 1820-1926, and remained official in the National Formulary, 1926-65. In spite of the fact that it is no longer an official drug, however, it is still much in demand by manufacturers of pharmaceutical products.

Rural practitioners were particularly fond of Sassafras tea for treating high blood pressure and for promoting perspiration in fevers and colds. The Pennsylvania Dutch used the fresh or dried blossoms in the treatment of fevers and from the berries made a wine for colds. In Appalachia a tea of the root bark is still used in the treatment of bronchitis. It was also used in some areas to increase urine flow, relieve gas and upset stomach, to increase perspiration, and in the early 1800's to slow up the milk flow in nursing mothers.

Oil of sassafras, distilled from the root bark, during the 1800's became an important ingredient in many proprietary medicines, the demand for which was so great that during the last half of the 19th century the oil was manufactured on quite a large scale. Vogel (1970) reports that in 1883 in Buckingham County, Virginia, 40 distillers in that area alone were manufacturing sassafras oil, consuming daily 80,000 pounds of the roots, yielding about 50 gallons of oil, which was shipped to the New York market in 5-gallon cans. Sassafras oil (also an official drug, 1820-1965) is a volatile oil, and safrone (official in the U.S. Pharmacopeia, 1905-16) is a phenolic ether tained from sassafras oil; both products have been described as carmina- and stimulant. It was sometimes used to relieve the pain caused by menstrual obstructions and that following parturition, but it sometimes produced marked narcotic poisoning. Its use has caused abortion in several cases, and too large doses of the oil have resulted in nausea, depressed circulation, paralysis of the respiratory system, and death. The aromatic oil is still found useful as an antiseptic agent in dentistry, as a flavoring agent in candies, soft drinks, and medicines, and as an ingredient in root beer and other carbonated beverages, chewing gum, toothpastes and powders, mouthwashes, and soap. It is also used in the manufacture of perfume.

But Sassafras had many uses other than purely medicinal ones, for William Penn reported that early settlers in Pennsylvania used Sassafras in the preparation of their molasses beer. During the early 1800's Michaux gave more details concerning its preparation: "In Virginia and in the more southern states, the country people make a beer by boiling the young shoots of Sassafras in water, to which a certain quantity of molasses is added, and the whole is left to ferment; this beer is considered as a very salutary drink during the summer." In some areas the berries were used as a substitute for pimento. In addition, it has always been a favorite in rural areas as a source of tea because of its aromatic odor and flavor. Many country people still take Sassafras tea each year as a spring tonic in the belief that it not only "thins the blood" but also prepares the body to stand the coming heat of summer. This tea was made by brewing the roots (some say the young shoots also), dug up in early spring; the bark can be peeled from the roots, dried, and stored for future use. Served with cream and sugar, this deep red brew is much relished by some, but others find it rather unpleasant. The roots can be brewed several times before all the flavor is extracted, but it should be remembered that when taken in large doses, Sassafras has stimulant and narcotic effects. Taken in moderate amounts, however, it is by many considered a wholesome and palatable beverage.

In Louisiana, Choctaw Indians prepared from the leaves a powder called gumbo fillet, used to give flavor and consistency to gumbo soup--a practice later adopted by the Creoles and still highly prized in New Orleans cookery. For this purpose the mature, green leaves were dried and powdered, the coarser veins and stems being sifted out, after which the powder was stored for future use. A heaping tablespoonful of this preparation, added to soups, stew, chowder, or gravy will give them a smooth, mucilaginous consistency and a unique flavor much relished by those accustomed to it. Peter Kalm reported in 1772 that the flowers were gathered in Pennsylvania for use as a tea, a practice they may have learned from the Iroquois, who made a similar preparation from the flowers. He also stated that some housewives put Sassafras chips in chests with their woolens in the belief that the odor would repel moths. It was considered as effective as Red Cedar for that purpose and at the least added a delightful fragrance when packed with winter clothes.

Sturtevant (1919) reported that "Sassafras tea, mixed with milk and sugar, forms a drink known as saloop, which is still sold to the working classes in the early morning at the corners of the London streets." The dried bark can likewise be used to make a strong-flavored candy by grating it into boiling sugar and water then cooling the mixture. Even the dried bark alone or the spicy-fragrant twigs furnish an occasional nibble. Gibbons (1962) states that the addition of 3 tablespoons of honey and 3 tablespoons of vinegar to 1 quart of Sassafras tea served ice-cold makes a delicious drink. He also made a honey-sassafras jelly by dissolving 1 package of powdered pectin (Sure-Jell) in 2 cups of strong Sassafras tea. After bringing this mixture to a boil, he added 2 tablespoons of finely grated dried root bark and 3 cups of strained honey. It was then brought to a boil again, simmered for 5 minutes, poured into jars, and sealed for later use with meat and hot breads.

Its role in American folklore is rather unique and some of the superstitions that sprang up around it have not yet entirely disappeared in some areas. Its odor was reputed to drive away bedbugs, so not only were many bedsteads made of it but in Louisiana the negroes often made their cabin floors of it for the same reason. In West Virginia henroosts were constructed of Sassafras to keep out chicken lice. In Appalachia, where soap is still sometimes made at home, it was supposed that the kettle must be stirred with a Sassafras stick to ensure a good quality of soap.

In addition to all its other uses, it was early discovered that bark of the Sassafras root yielded brown, rose-tan, and rose-brown dyes, depending on the type of mordant used, a chrome mordant resulting in rose-brown on wool while an alum mordant yielded brown and rose-tan. To produce brown on 1 pound of wool, use 12 ounces of dry Sassafras bark with an alum mordant, 1/6 ounce of potassium dichromate, and 1/6 ounce of acetic acid or 6 to 7 tablespoons of vinegar. Cover the bark with water and soak it overnight. The next morning boil the mixture for 30 minutes, strain out the bark, and add enough water to make a dyebath of 4 to 4 1/2 gallons. Thoroughly rinse the mordanted wool, squeeze out excess moisture, immerse it in the dyebath, and boil for 30 minutes. Without rinsing, transfer the wool to a boiling bath of potassium dichromate, acetic acid, and 4 gallons of water. Omitting the last step, i.e., the bath of potassium dichromate and acetic acid, will result in a rose-brown color. In colonial New England the flowers were used with an alum mordant to obtain a yellow dye, and the root bark, combined with plum bark, yielded a brown. In Philadelphia during the middle of the 18th century a fine sunfast orange on wool was obtained from the bark. The wool was dyed in a brass boiler, with urine used in place of the usual alum mordant. Professional dyers of the 19th century, however, did not make much use of Sassafras bark as a source of dye because similar results could be obtained with other substances, but home dyers continued to use it when they lived near a source of supply.

The wood of this species is soft, weak, light, brittle, coarse-grained, aromatic, and medium-light, with light sapwood and dull orange-brown heartweed, but it is amazingly durable in contact with water or soil. Pioneers used it for fence posts and rails, and dugout canoes made from its wood have lasted 30 years or more. It has also been used for pails, in cooperage, and the building of light boats as well as in the construction of furniture. It is reported that it has sometimes been marketed as ash or chestnut lumber. Like chestnut wood, it pops and shoots sparks when used as firewood.

The fruit of the Sassafras tree is found attractive by at least 18 species of birds, but Martin et al. (1951) remark that the quantities eaten are so limited that it cannot be regarded as an important source of food for wildlife. They note in passing, however, that, in addition to bobwhite, the kingbird, crested flycatcher, and the phoebe--members of the flycatcher family subsisting primarily on insects--are among those that eat the fruits of this tree.

RANUNCULÀCEAE, the Buttercup Family

Cronquist (1968) places this family in his order Ranunculales, which includes seven other families with about 3200 species, nearly 3100 of which belong to only three of the eight families included by him in this order--Ranunculaceae (2000), Berberidaceae (650), and Menispermaceae (425). He states that "The Ranunculales are pretty clearly derived from the Magnoliales," and that "Within the Ranunculales, there is no obvious reason why the Ranunculaceae might not be ancestral to all the other families of the order."

As traditionally conceived, this is a moderately large family, chiefly of the cooler temperate regions of the earth but most abundant in the forested parts of the north temperate zone, composed of about 35 to 40 genera and perhaps 1500 species. The juice of the plants comprising this family is usually acrid or even poisonous, and alkaloids from some species are used in medicine. The Ranunculaceae are distinguished from related families by their usually herbaceous nature, the leaves often divided or compound, the flowers mostly bisexual with reduced or modified petals, with mostly numerous and spirally arranged stamens, and generally several to many pistils. The family falls into several well-defined tribes, distinguished by characters of the flower and fruit.

Economically the family is of domestic importance for the large number of ornamentals available from its components, represented by some 27 genera and about 280 species, including Buttercup, Larkspur, Anemone, Columbine, Clematis, Marsh Marigold, and Peony. From Monkshood (Aconitum) are obtained febrifuges important in internal medicine, but these plants contain strong narcotics that are exceedingly poisonous when parts are eaten. Hydrastis canadensis, Golden Seal, a rare plant in New York State, is still in demand as a drug plant by manufacturers of pharmaceutical products, although it has not been listed as an official drug since 1960.

Key to Genera of the Catskill Ranunculaceae

1. One or more sepals or petals spurred (each of the 5 conspicuous petals prolonged backward into a long spur; leaves ternately compound, the basal ones usually with 3 long-stalked compound divisions) .... Aquilegia
1. None of the sepals or petals spurred, 2
  2. Flowers irregular, the upper sepal hooded, helmet-like, blue .... Aconitum
  2. Flowers regular, 3
    3. Flowers deriving their color and size principally from the numerous stamens; sepals small, inconspicuous, usually early deciduous, 4
      4. Flowers in a large branched panicle, commonly unisexual; leaflets with rounded or blunt teeth (leaves all alternate, ternately compound or decompound) .... Thalictrum

    4. Flowers in a simple raceme, at anthesis less than 1 dm long; leaflets sharply toothed (pistil 1, developing into a red or white, fleshy, berry-like fruit)................ Actaea
3. Flower deriving its color and size principally from the expanded sepals or petals, 5
    5. Leaves opposite or whorled, 6
        6. Sepals 4; stems climbing or scrambling (styles elongate and plumose)... Clematis
        6. Sepals commonly 5 or more: stems (or scapes) erect or ascending (leaves palmately lobed, incised or divided, but not truly compound; achenes not ribbed; lobes of leaflike bracts sharply toothed).......................... Anemone
    5. Leaves alternate or all basal, 7
        7. Flowers green to yellow, yellow to orange, or red, 8
            8. Sepals and petals both well developed; at least some of the leaves lobed or compound; fruit an achene (petals with a nectariferous spot or scale at base)............... Ranunculus
            8. Sepals large and well developed, petals none; leaves rounded or reniform, neither lobed nor compound; fruit a follicle.. Caltha
        7. Flowers white to pink, rose, blue, or blue-purple, 9
            9. Plants with cauline leaves; leaves dissected into numerous linear segments (aquatic plants; flowers white).... Ranunculus
            9. Plants acaulescent; leaves lobed or compound, the segments not linear, 10
                10. Leaves simple, 3- (rarely 5-) lobed, all basal; sterile stamens none; fruits sessile............. Hepatica
                10. Leaves trifoliate, the segments nearly or quite sessile; sterile stamens present; fruits stalked...... Coptis

Aconitum L. Monkshood.

These are hardy, herbaceous, perennial plants that bear helmet-shaped flowers in summer and early autumn, embracing about 80 species, chiefly natives of the mountainous parts of the northern hemisphere, most abundant in Asia; several others occur in the western states. They have palmately cleft or dissected leaves and showy yellow or blue flowers in racemes or panicles. Aconitum is closely related to Delphinium, which it resembles in color, habit, and habitat, and with which it is often confused. The name of the genus, the ancient Greek and Latin name, is of uncertain origin. They are distinguished by having the posterior sepal in the form of a helmet, hence the English name of Monkshood. A. napellus grows wild in the mountain forests of France, Switzerland, and Germany, and is also much cultivated in the flower gardens of both Europe and the United States. In the northeastern states and adjacent Canada the wild species are usually rare or local. Several other species are in cultivation, but they should never be planted in the vegetable garden, as the roots have occasionally been mistaken for Horseradish and used as a condiment with fatal results.

Although all species contain an active poison, several of the monkshoods have valuable medicinal properties when used with knowledge. Both A. napellus and A. columbianum, a species of the western states, are sources of the drug aconite and the alkaloid aconitine. The roots of A. ferox supply the famous poison of India called bikh or bish. It contains considerable quantities of the alkaloid pseudo-aconitine, which is the most deadly poison known; it exists in all parts of the plant, but especially in the root. It is more powerful than prussic acid and acts with tremendous rapidity. Aconite poisoning of wells by A. ferox has been carried out by natives of India to stop the progress of an army. The natives also use it for poisoning spears, darts, and arrows, and for destroying tigers. The roots of one or two other species are said to be as virulent as those of A. ferox. As garden plants the aconites are very hardy ornamental perennials. They thrive well in any ordinary garden soil, will grow in the shade, and are easily propagated by division of the root or by seeds.

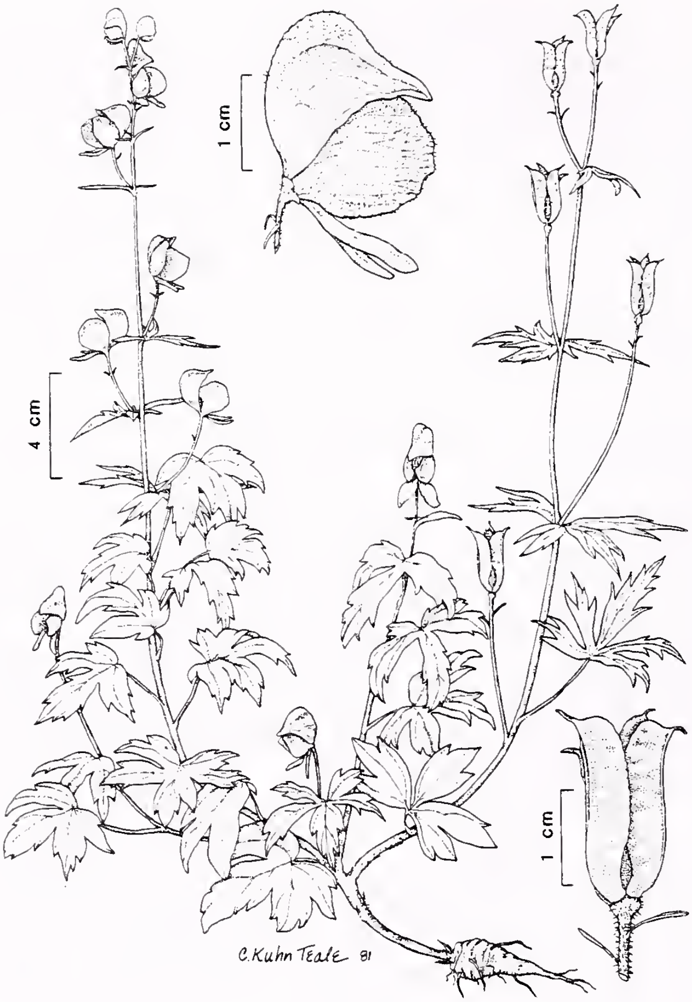
Aconite was well known to the ancients as a powerful poison but was first employed as a medicine by a Viennese physician around 1762. The U.S. Dispensatory of 1865 states that "It is a powerful sedative to the nervous system, reducing also the force of the circulation. It has long enjoyed, in Germany, a high reputation as a remedy in rheumatism. By some practitioners it is considered as one of the most effectual remedies in neuralgia, in which it is used both internally and as a local application." The systemic effects of therapeutic doses consist mainly in slowing the heart rate. Aconite was formerly employed in the treatment of heart disease, hypertension, and in sthenic fevers, but at one time many practitioners considered it of doubtful value, except for external application against neuralgic and rheumatic pains. Even then, it must be used with extreme care and in small quantities, and not at all where cuts or cracks are present in the skin.

In medicine, preparations of aconite have been used as an anodyne, diuretic, and diaphoretic. According to one authority, the value of aconite as a medicine has been more fully realized in modern times, and it now ranks as one of our most useful drugs, but it must be remembered that aconite is a deadly poison. Preparations of aconite are still employed for outward application locally to the skin to diminish the pain of neuralgia, sciatica, pleurisy, lumbago, and rheumatism.

Loss of life in livestock and in human beings has occurred from ingestion of Aconitum or extractions made from it. A. napellus is considered one of England's potentially most dangerous poisonous plants. Kingsbury (1964) reports that in the United States aconite poisoning of livestock has occurred but it does not appear to produce significant losses among livestock. Most cases of poisoning ascribed to aconite on the range turn out on careful investigation to have been confused with larkspur, which is much the more common plant. Formerly, poisoning of humans occurred occasionally from misuse of extracts of aconite. These are now only rarely employed in human or veterinary medicine.

Aconìtum noveboracénse Gray. Northern Monkshood.

Meaning of Species Name. Of New York.
Other Names. Aconite, Wolfsbane.
Type of Plant. A perennial herb.
Habitat. Rich woods, shaded ravines, and damp slopes.
Range. Local, Catskill mts, ne Ohio, and the unglaciated parts of Ia and Wis.



Aconitum noveboracense--Northern Monkshood
[From Mitchell & Dean (1982), p. 14.]

Distr in NYS. Chenango and Ulster co.

Distr in the Torrey Range. Known from Ulster co, and from an unrecorded locality in Orange co, otherwise unknown.

Time of Fl. (Jun)Jul(Aug).

Origin. Native.

Clute (1898) reports that this rare species was first described from specimens found on the bank of the Chenango river (Chenango County) in 1883, although the "herbarium of Columbia University contains a specimen collected at Greene, N. Y., by Dr. Augustus Willard about the year 1857." Gleason and Bonisteel (1929), however, state that this plant "was originally discovered by A. Willard in Chenango county, New York, prior to 1857; it was again collected ..., in the same county, by A. L. Coville and F. V. Coville in 1885 and 1887. It was later found by Mr. & Mrs. Brunt ... in Ulster County and again along the same river by Dr. H. H. Rusby in 1891." This is certainly one of the rarest plants in New York State, and, since there is strong evidence that it can no longer be found farther west, every effort should be made to protect it wherever it grows. Under no circumstances should it ever be collected.

Actaea L. Baneberry.

There are about seven species of Actaea, hardy, herbaceous perennial plants of the north temperate zone with attractive fernlike leaves (the ovate leaflets of which are sharply toothed) and short, thick terminal racemes of small white flowers in May, followed (in ours) by red or white berry-like poisonous fruits. They grow wild in Asia, Europe, and North America; in addition to ours, two others occur in the western states. The word Actaea refers to the elder-like leaflets and is derived from the Greek aktea, the Elder, transferred by Linnaeus to this genus. These plants are sometimes grown in partially shaded places in wildflower gardens.

The European A. spicata is a plant of an acrid poisonous nature throughout, and though the root has been used as an antispasmodic in some nervous disorders and is said to be a remedy for catarrh, it must be administered with great caution. The juice of the berries, mixed with alum, yields a black dye. Kingsbury (1964) states that "Members of this genus, particularly the European Baneberry, ... are considered poisonous and references may be found in European works concerning the death of children after eating the conspicuous berries." In Europe it is classed among the poisonous plants acting upon the heart. Toxic action is attributed to an essential oil which produces symptoms of severe gastroenteritis, but cases of loss of life, either human or of livestock, have not been recorded in the United States.

A. arguta, a western species, was regarded by the Indians as a medicinal plant, the seeds being gathered in the fall and the roots as needed. The seeds were pulverized and mixed with pine pitch to make a poultice used in the treatment of neuralgia. A pinch of the dried ground seeds added to a dish of food was administered as a remedy for diarrhea. The roots were considered laxative and were also used for their emetic properties. Ground-up roots were also sometimes mixed with tobacco or grease and rubbed on the body to treat rheumatic pains.

Martin et al. (1961) list only the ruffed grouse and the white-footed mouse as making use of our two northeastern species as food.

Key to the Catskill Species of Actaea

1. Ovary scarcely narrowed distally, its diameter less than that of the broad sessile stigma; pedicels stout, in flower 3-6 mm long; fruit white, rarely dull purple-red; leaves glabrous beneath except for a few hairs on the veins........................ A. alba
1. Ovary narrowed distally to a short neck, its diameter greater than that of the stigma; pedicels slender, in flower 8-15 mm long; fruit crimson, rarely white; leaves usually with scattered hairs over the entire lower surface............................ A. rubra

Actaèa álba (L.) Mill. White Baneberry.

Meaning of Species Name. White.

Synonyms. A. pachypoda Ell. in Fernald (1950).

Other Names. White Cohosh, Doll's-eye(s), Blue Cohosh, White-beads, Necklace-weed, White-berry, Snake-root, Herb-christopher, Grapewort, Rattlesnake-herb.

Type of Plant. A perennial herb, reproducing by seeds.

Habitat. Rich woods and thickets.

Range. Que to Ont, Minn, and Man, s to Ga, Ala, La, and Okla.

Distr in NYS. Common across the state, especially southw; rare northw, and absent from the higher Adirondacks.

Distr in the Torrey Range. Throughout the range except in the pine barrens of NJ and e and s of them; on LI only n of the moraine, always increasing northw.

Elevation. Collected at 2300 ft in Delaware co.

Time of Fl. May-Jun, fr Jul-Oct; fl May 10-30 at Cornell.

Origin. Native.

Remarks. Flowers a week or two later than A. rubra.

Millspaugh (1887) reported that this species, as well as A. rubra, had received the attention of many writers on medical botany and that the two species were considered to be quite similar in their medical properties, but he warned that they were quite different from Cimicifuga and should under no circumstances be confused with that drug. He also remarked that the two species of the northeastern states are much milder in their properties than is the European A. spicata. Rafinesque stated that in Canada the roots of A. alba were considered repellent, nervine, and prescribed for debility, while Millspaugh thought them useful "in many forms of reflex uterine headache, some types of chronic fleeting rheumatism, [and] congestion, in the female especially ..." The Chippewas, curiously enough, employed a decoction of the root in the treatment of excessive menstrual flow. Cheyenne women drank a tea made from the leaves of the White Baneberry to induce secretion of milk, while the Thompson Indians used a decoction of the roots in the treatment of syphilis and rheumatism, but they were cautious of the dosage because too strong a brew sometimes resulted in death. This species was also considered by the natives of America as a valuable remedy against snake-bite, especially of the rattlesnake.

A cross between this species and A. rubra has been collected at Highmount, Town of Shandaken, in Ulster County.

Actaèa rùbra (Ait.) Willd. Red Baneberry.

Meaning of Species Name. Red.

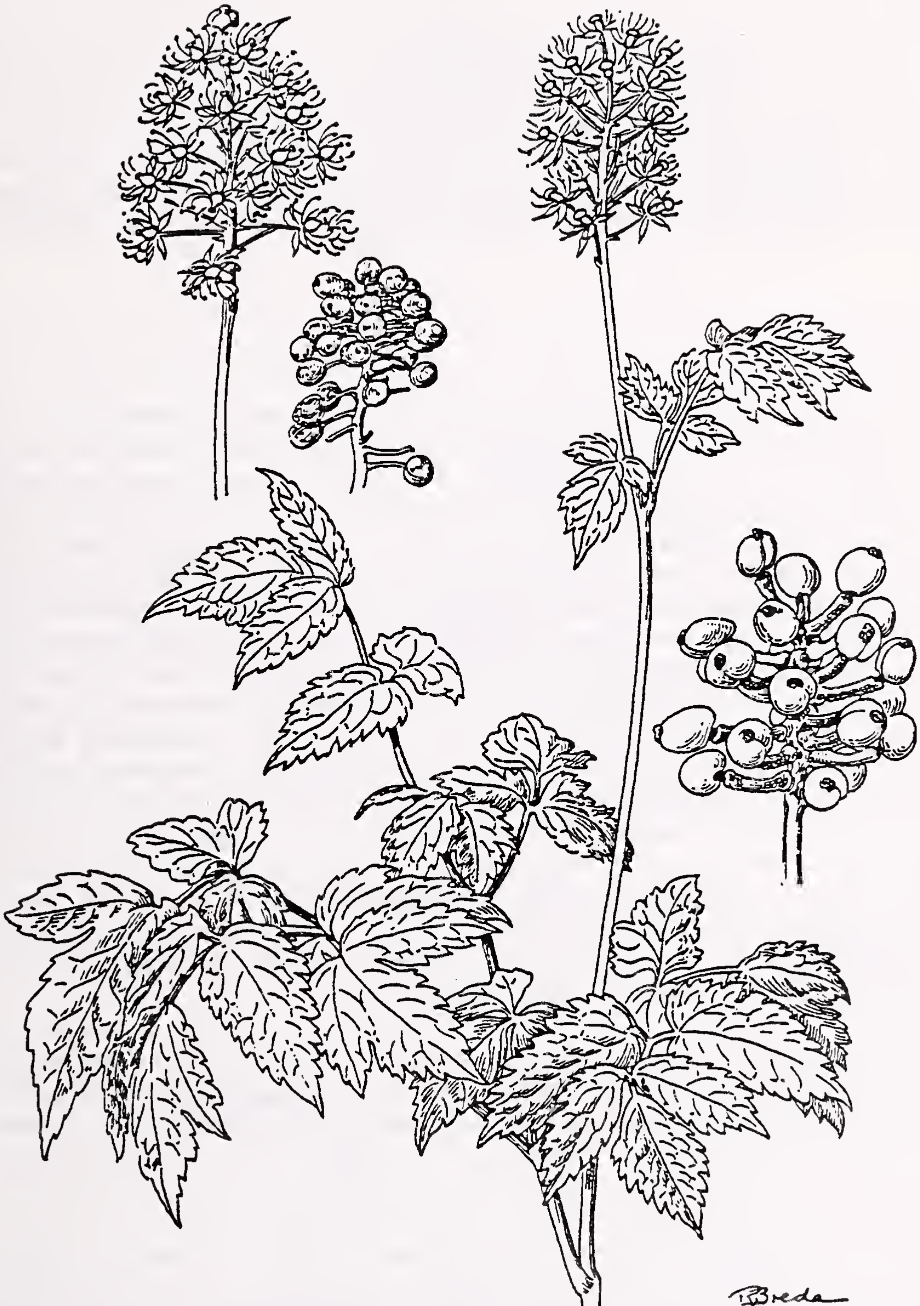
Other Names. Snake-berry, Black Cohosh, Coral-berry, Red-berry, Snake-root, Poison-berry, Toad-root, Grapewort, Rattlesnake-herb.

Type of Plant. A perennial herb, reproducing by seeds.

Habitat. Rich woods and thickets.

Range. Lab and Nf to Ak, s to Ct, NJ, WVa, O, Ind, and Ia; SD, Col, Utah, and Ore.

Distr in NYS. Common throughout most of the state, but less frequent southw and rare on LI.



(Left) Actaea rubra--Red Baneberry
(Right) Actaea alba--White Baneberry
[From Smith (1966), Plate 60, p. 140.]

Distr in the Torrey Range. NY: Very rare and local on the n side of LI; near Silver L, SI, thence increasing but not common northw, becoming frequent above the Hudson highlands.

Elevation. Sea level-3860 ft in the Torrey range.

Time of Fl. May-Jul, fr Aug-Oct; fl Apr 25-May 25 at Cornell.

Origin. Native.

The berries of this species are known to be poisonous; in one case, eating six berries was sufficient to produce increased pulse, dizziness, burning in the stomach, and colicky pains. The rootstock is a violent purgative, irritant, and emetic, but the Chippewas used it in the treatment of men's diseases. In addition Johnston (1970) states that "The roots were boiled and the decoction taken for coughs and colds, or used to treat sick horses."

Anémone L. Anemone.

This is a genus containing from 100 to 120 species, mostly in the north temperate zone, natives of Eurasia, Japan, and North America, extending into the arctic in both hemispheres. The plants are perennial herbs with radical, deeply cut leaves and elongated flower stems bearing white, red, blue, or, rarely, yellow flowers that have no true petals; the showy part of the flower consists of petal-like sepals. Some authorities derive the name of the genus from the Greek anemos, wind, of questionable application, but from which comes the popular English name of Windflower. Others state that the Greek and Latin name is a corruption of Na 'man, the Semitic name for Adonis, from whose blood the crimson-flowered anemone of the orient is said to have sprung. There are about 20 species in the United States and Canada, with representatives in all regions from arctic America and Alaska south to Florida, Texas, and California. Most of the American species are more suited to the wild garden or for naturalizing in open spaces among deciduous trees, but some of the European species are delightful plants for the rock garden or the perennial border. Among the best known of the garden plants is A. coronaria, the Poppy Anemone, a tuberous-rooted plant with divided leaves and large showy poppy-like blossoms on stalks from 6 to 9 inches high. A. pulsatilla is another garden favorite.

This genus furnished the American Indians with a number of medicinal plants. Vogel (1970) reports that the root of A. cylindrica, the Long-headed Anemone, was a highly prized medicine among the Omaha and Ponca tribes for use in the treatment of wounds. The root was boiled to make a wash that was applied externally to the injured area. There was good reason for this practice, for anemonine, found in many related species of this genus, is clinically asserted to be a potent antiseptic. The Meskwakis used the leaves of this species to make a poultice for bad burns, while the Ojibwas employed the roots to make a tea for lung congestion and tuberculosis. The Meskwakis also used the roots of A. cylindrica to make a tea for headache and dizzy spells. The fresh leaves of A. patens, the Pasque Flower, were crushed by the Omahas and applied to parts afflicted by neuralgia and rheumatism. It is said to act as a counterirritant, causing blisters if left on too long. The Indians of British Columbia called this or a closely related species the Bleeding-nose Plant; its blossoms were held to the nose or they inserted the leaves into the nostrils until bleeding subsided.

Johnston (1970) states that "cotton" from the ripe seed heads of A. multifida, the Cut-leaved Anemone, was burned on hot coals by the Blackfoot Indians and the smoke inhaled as a headache remedy.

Several species of Anemone were also employed medicinally by the whites, both in Europe and in the United States. In the fresh state most of the species are acrid and rubefacient, in this respect resembling other members of the Ranunculaceae. A. ludoviciana, A. pratensis, and A. pulsatilla were all once employed with supposed advantage in the treatment of chronic diseases of the eyes, in cutaneous eruptions, in syphilitic affections, and in whooping cough. In the United States A. patens, together with two European species, were official in the U.S. Pharmacopeia, 1882-1905, and in the National Formulary, 1916-47, under the name pulsatilla, for use as a diuretic, expectorant, and emmenagogue.

Many world publications list the anemones as poisonous plants. They have been suspected of causing livestock loss in the United States, but Kingsbury (1964) states that there is no definite proof or clear-cut substantiation. Nevertheless, the Pasque Flower, A. patens, covering wide areas of the dry prairies in the midwest, might well be considered a potentially dangerous plant to grazing animals.

A. canadensis has been collected once in Delaware County, where it grew on the site of an old garden, having persisted for well over 50 years. To all appearances it had even spread beyond the area previously cultivated. Since it spreads by means of its rhizomes, however, it seems more appropriate to regard this species as persistent after cultivation rather than as a natural part of the Catskill flora. The Meskwakis used the roots of this species to make a tea for headache and dizzy spells, while the Pillager Ojibwas used it as a throat lozenge to clear the throat so they could sing well. An infusion of the roots was also used as a wash for eye ailments.

Key to Local Species of Anemone

1. Plants 8-20 cm tall; 1-flowered; carpels and achenes densely short-hirsute but not woolly, in maturity forming loose globular heads; flowering May 1-20.. A. quinquefolia
1. Plants taller, usually not less than 25 cm tall, often 60-90 cm; 2- to several-flowered; carpels and achenes densely long-pubescent, in maturity long-woolly and forming dense woolly, cylindrical heads; flowering in July...................... A. virginiana

Anemone quinquefolia L. Wood Anemone.

Meaning of Species Name. Five-leaved.

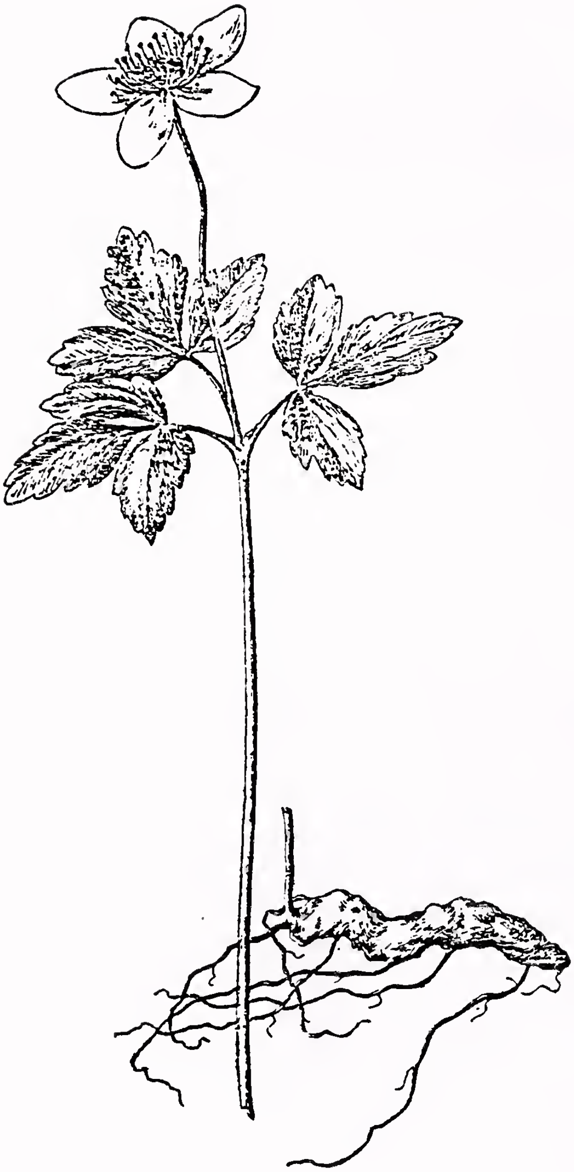
Other Names. Windflower, Snowdrops, Woodflower, Mayflower, Nimbleweed, Wild Cucumber.

Type of Plant. A perennial herb.

Habitat. Open rocky woods, thickets, and clearings.

Range. Que and Ont, s to NJ, O, Ky, and along the mts to n Ga.

Distr in NYS. Common across the state southw; rather local northw to the e foothills of the Adirondacks, along L Champlain, and in



Anemone quinquefolia--Wood Anemone
[From Parsons (1914), p. 21.]

Clinton co, and w of the mts northw to St Lawrence co.

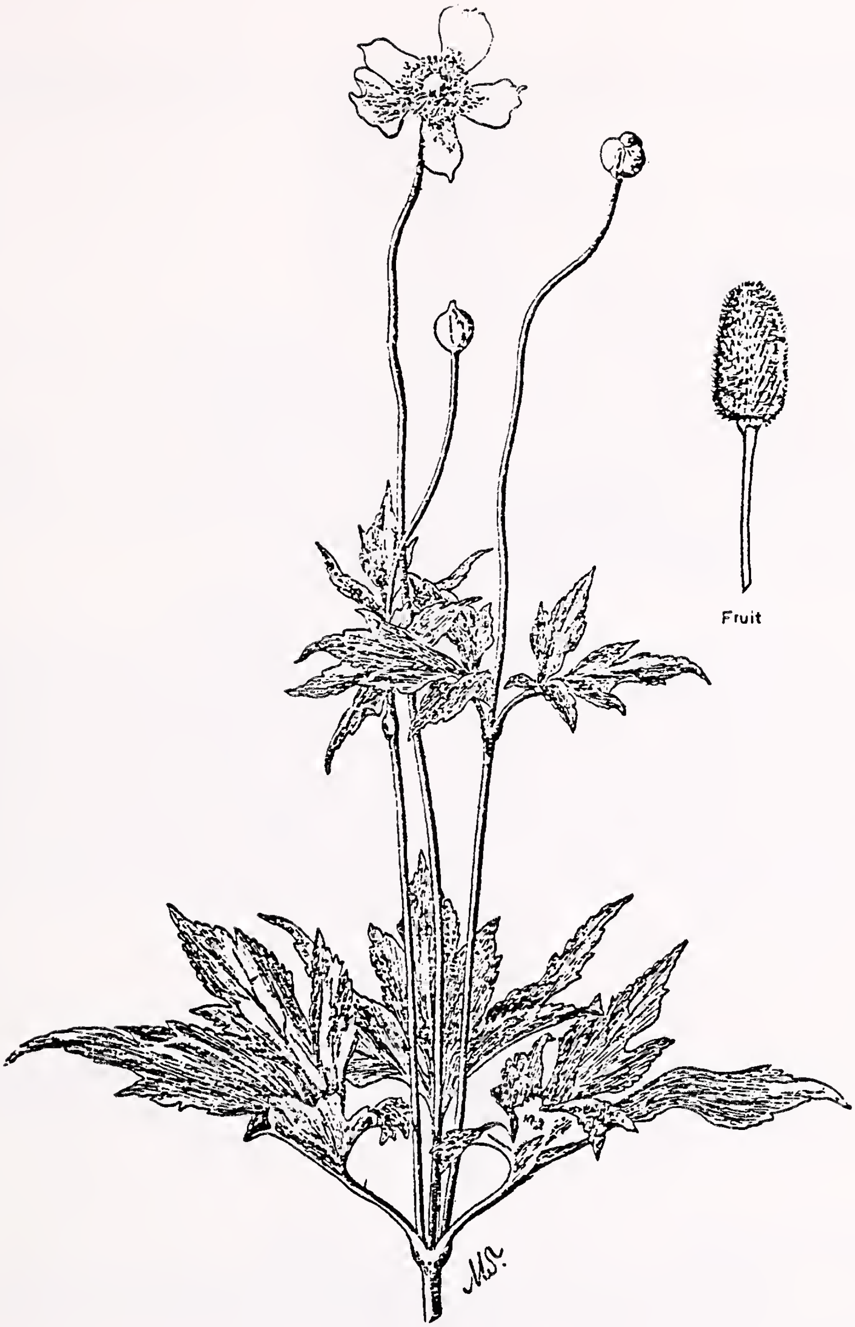
Distr in the Torrey Range. Throughout the area except the pine barrens, there rare or wanting.

Time of Fl. Apr-Jun; May 1-20 at Cornell.

Elevation. Collected at 2000 ft in Delaware co.

Origin. Native.

The European Wood Anemone, A. nemorosa, a closely related species, possesses all the acrid nature of its tribe. Cattle have been poisoned, Linnaeus tells us, by eating it in the fresh state after having been underfed and kept on dry food during the winter, so that they were ready to browse on the first green leaves they saw. A vinegar made from the leaves retains all the more acrid properties of the plant and in France is put to many domestic purposes; its rubifacient effects have caused it to be used externally in the same way as mustard. Although this species of Anemone has



Anemone virginiana--Thimbleweed
[From Dana (1900), Plate 35, p. 79.]

practically fallen out of use as a medicinal plant, the older herbalists in addition recommended application of various parts of the plant for headaches, tertian agues, and rheumatic gout. An infusion of the plant was also said to be effective in ridding the body of head lice. While records of medicinal use of our native plant seem to be extremely scant, it does possess all the attributes of the European species.

Our Wood Anemone is suitable for naturalizing in open woodlands, beneath deciduous trees, and in shady places in the rock garden. The somewhat sticklike roots should be planted in September. Several attractive horticultural varieties of the European Wood Anemone have also been developed.

Anémone virginiàna L. Thimbleweed.

Meaning of Species Name. Virginian.
Other Names. Tall Anemone, Tumbleweed.
Type of Plant. A perennial herb.
Habitat. Dry or rocky open woods, thickets, slopes, and meadows.
Range. Que to Minn and ND, s to Ga, Ala, Ark, and Kan.
Distr in NYS. Common in most secs of the state.
Distr in the Torrey Range. NY: Rare and local on the s side of LI, not common on the n side and on SI, thence increasing and common northw.
Elevation. Sea level-4020 ft in the Torrey range.
Time of Fl. Late Jun-Aug; Jul at Cornell.
Origin. Native.

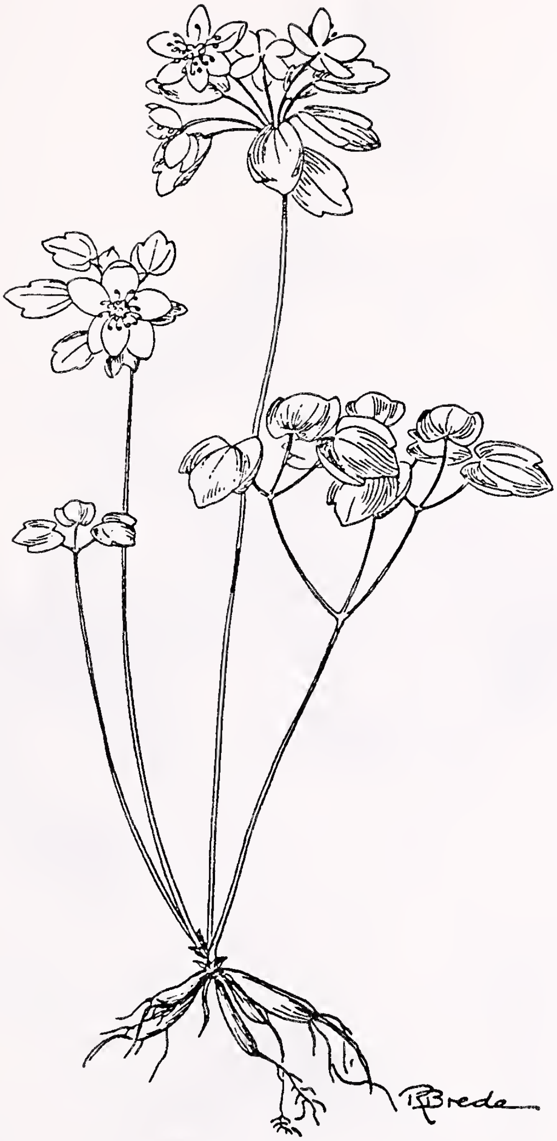
Vogel (1970) reports that the Menominees made a wet poultice from the roots of this plant for use in the treatment of boils, while the Meskwakis put its seeds on hot coals to make a smoke for treating patients suffering from catarrh and to revive unconscious persons. Peter Kalm remarked that the Iroquois used "cotton" from the ripe heads of this species to stuff into hollow teeth as a toothache remedy, while Herrick (1978) was of the opinion that the Iroquois thought this species was also effective "in curing or preventing certain severe, English-named diseases" such as smallpox, cancer, tuberculosis, and syphilis.

Anemonélla Spach. Rue-anemone.

This is a monotypic genus comprising a low glabrous perennial herb with compound radical leaves. The name of the genus is a diminutive of Anemone, to which this plant has sometimes been referred.

Anemonélla thalictroìdes (L.) Spach. Rue-anemone.

Meaning of Species Name. Like Thalictrum, in allusion to the compound leaves, which resemble those of Meadow-rue.
Other Names. Wind-flower, May-flower.
Type of Plant. A low glabrous perennial herb.
Habitat. Open Woods.
Range. Sw Me and NH to Minn and Kan, s to Fla, Miss, Ark, and Okla.
Distr in NYS. Frequent or common across the state s of the Adirondack reg; rather local in the n part of its range, becoming common southw.
Distr in the Torrey Range. Common throughout the range except in the pine barrens, there wanting.
Time of Fl. Ape-May(Jul); Apr-May 30 at Cornell.
Origin. Native.



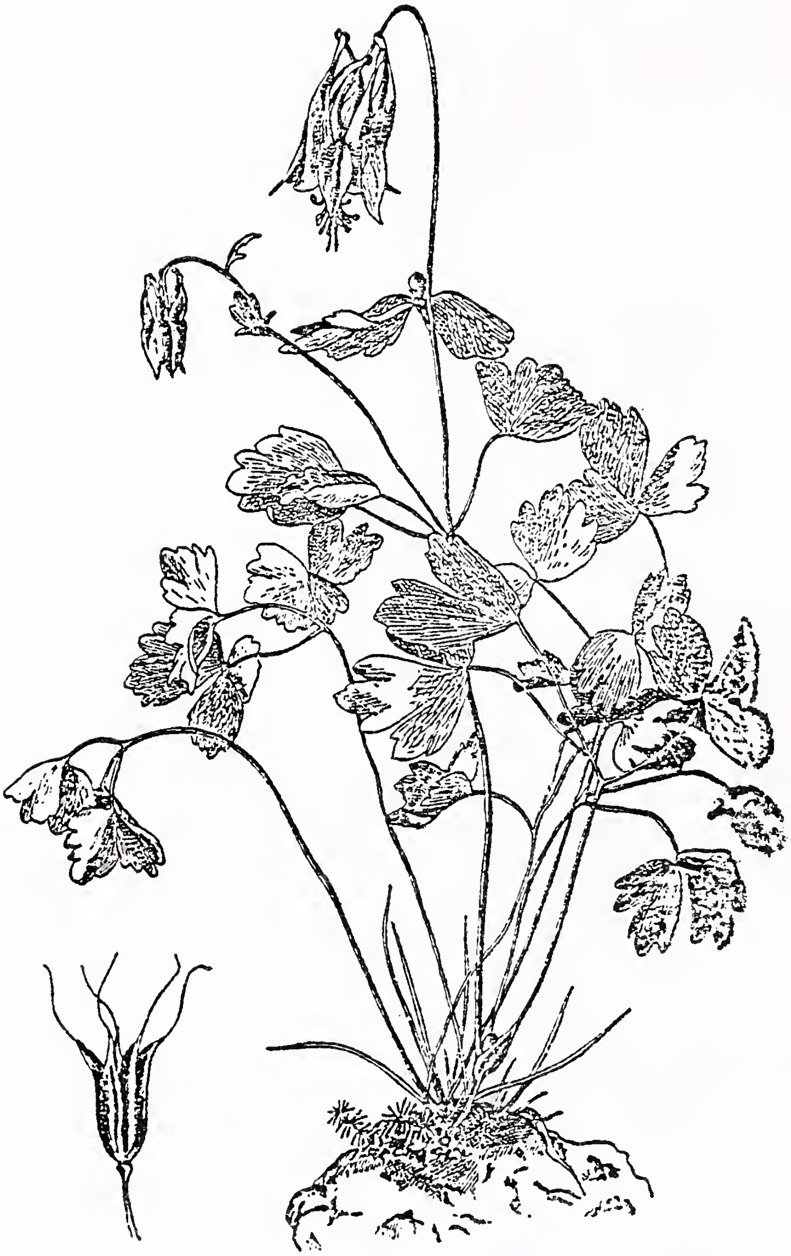
Anemonella thalictroides--Rue-anemone
[From Smith (1966), Plate 54, p. 129.]

Aquilègia L. Columbine.

There are from 60 to 75 species of Columbine, natives of north temperate regions. They rank among the most beautiful of flowers, several species of which are widely cultivated. The name of the genus is by some authorities derived from the Latin *aquila*, the eagle, from a supposed resemblance of the curved spurs to the claws of that bird.

Key to Local Species of Aquilegia

1. Spurs straight; flowers scarlet, yellow inside........... *A. canadensis*
1. Spurs strongly hooked; flowers white, pink, or blue........ *A. vulgaris*



Aquilegia canadensis--Wild Columbine
[From Dana (1900), Plate 130, p. 298.]

Aquilègia canadénsis L. Wild Columbine.

Meaning of Species Name. Canadian.

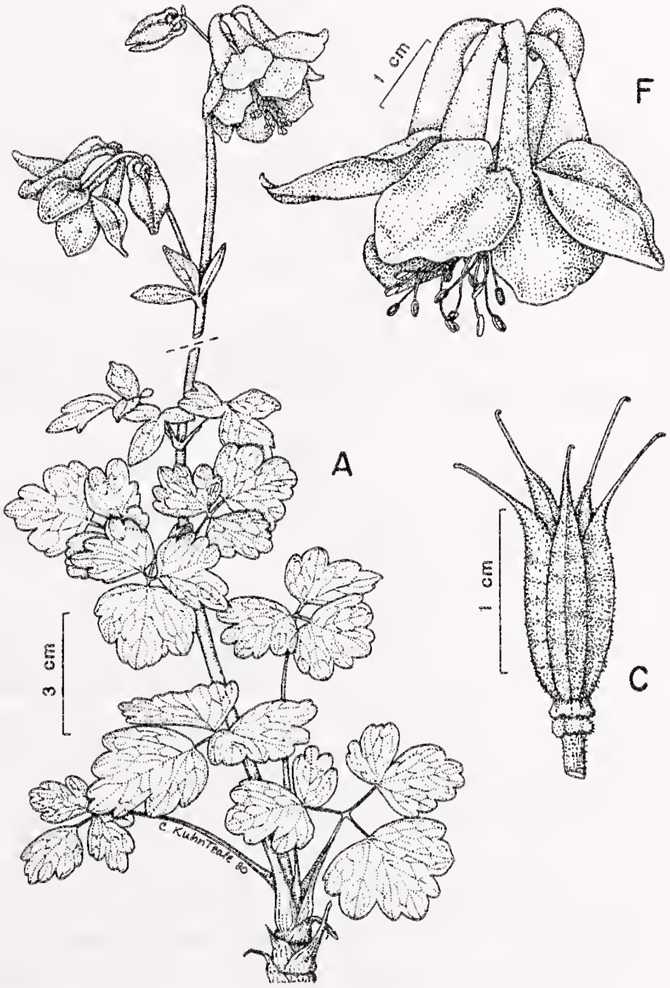
Other Names. "Meeting-houses," "Honeysuckle," Rock-lily, Bells, Jack-in-trousers, Cluckies.

Type of Plant. A perennial herb.

Habitat. Dry rocky, wooded or open, often springy, slopes, rocky cliffs and ledges, rarely in swamps.

Range. NS to Sask, s to Fla and Tex.

Distr in NYS. Common throughout the state.



Aquilegia vulgaris--Garden Columbine
[From Mitchell & Dean (1982), p. 64 .]

Distr in the Torrey Range. Common nearly throughout the range except in the pine barrens, there wanting; rare on LI.
Elevation. Grows to 5000 ft in Va; collected at 3375 ft in Delaware co.
Time of Fl. Apr-Jun(Jul); May-Jun at Cornell.
Origin. Native.

It is reported that some Indian tribes of the midwest used seeds of this plant as a love charm. After rubbing the pulverized seeds on his palms, the young brave contrived to shake hands with the desired one in the expectation that her fancy would be captivated. Sturtevant (1919) reported that in the western states some Indian tribes ate the roots of a related species as a famine food. They were no doubt first boiled to remove any poisonous properties contained in them; even so, they cannot be recommended as an emergency food.

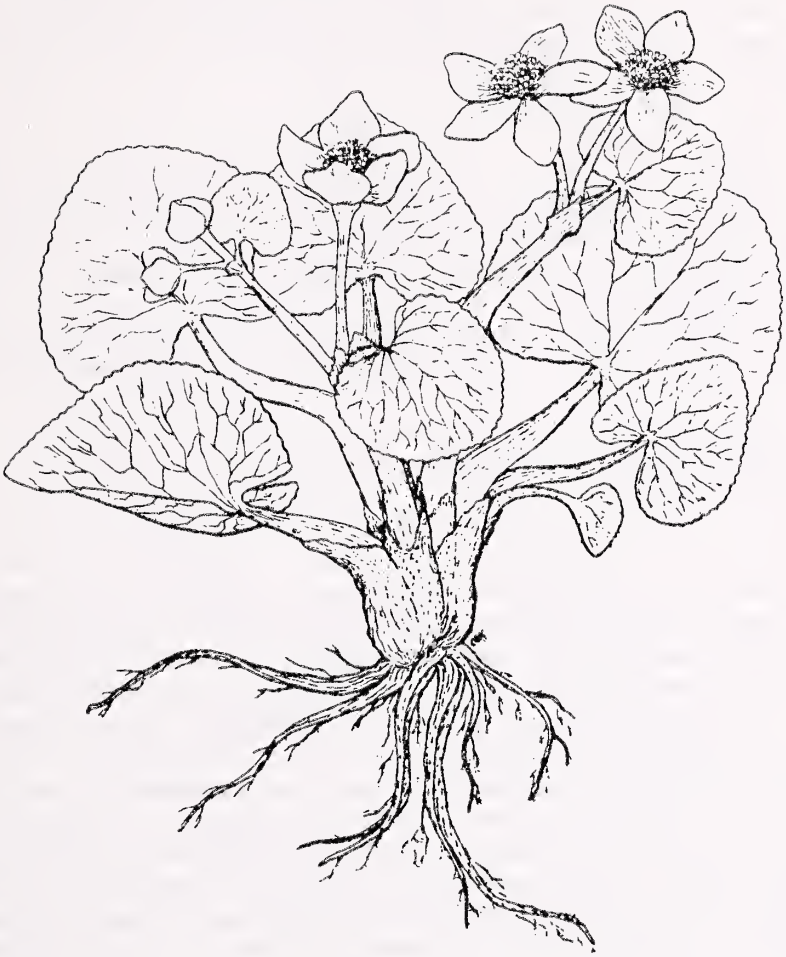
Aquilègia vulgàris L. Garden Columbine.

Meaning of Species Name. Common.
Other Names. European Columbine, Culverwort, Bluebells, Lady's-shoes, Capon's-tail, Cock's-foot, Snapdragon.
Type of Plant. A perennial herb.
Habitat. Roadsides and borders of woods and fields, and persisting about old grounds.
Range. Nf to Ont, s to Pa and Ia.
Distr in NYS. Locally common in many secs of the state.
Distr in the Torrey Range. A rather rare esc from gardens in most parts of our range.
Time of Fl. May-Jun; Jun at Cornell.
Origin. Introd from Eu.
Remarks. Cult for ornament and occasionally esc, especially in the cooler parts of the ne states and s Canada.

All parts of this plant have been used medicinally, particularly in Europe, where it was once considered as a diuretic, diaphoretic, astringent, and antiscorbutic. It has been employed in treating smallpox to promote eruption, in the treatment of scurvy and jaundice, and externally as a vulnerary. Culpepper reported that the leaves were successfully used in lotions for sore mouth and sore throat, the root was eaten "to help them when troubled with stone," and that the seeds, taken in wine, were considered useful in removing obstructions of the liver and in treating jaundice. Even in the time of Linnaeus, however, this plant was being regarded with some suspicion, for he reports that children had sometimes been poisoned by it when given in too large doses. "It is not used at present," states the U.S. Dispensatory of 1865, "and is even suspected to possess dangerous properties, like most other Ranunculaceae."

Cáltha L. Marsh Marigold.

There are about 15 or 20 species of Caltha in the cold temperate and arctic zones of both the northern and southern hemispheres; only one species occurs in the northeastern states, but five or six others are found in the



Caltha palustris--Marsh Marigold
[From Rhodora 83: Cover, 1981.]

western states. They are hardy glabrous, herbaceous, perennial marsh plants mostly natives of Europe and America with large round and cordate or reniform leaves. The name of the genus is the Latin name of a strong-smelling yellow flower, possibly the common Marigold, from calathos, a cup. They are easy to cultivate on the margin of a pool or pond, in the bog garden, or in the moist soil of a flower border.

Cáltha palústris L. Marsh Marigold.

Meaning of Species Name. Of swamps.

Other Names. King-cup, "Cowslip," May-blob, Meadow-gowan, Water-dragon, Water-blobs, Mire-blobs, Horse-blobs, Meadow-buttercups, American Cowslip, Spring Cowslip, Capers, Cow-lily, Crowfoot, Colts-foot, Soldiers'-buttons, Palsy-wort, Great Bitter-flower, Boats, Bull-flower, Water-goggles, Bull's-eyes.

Type of Plant. A perennial herb.

Habitat. Swamps, marshes, wet woods, wet meadows, bogs, ditches, and shallow water.

Range. Nf to Ak, s to SC, Va, WVa, Ind, Ill, Ia, and Neb, and in the mts to NC and Tenn; widely distr in Eurasia.

Distr in NYS. Frequent or common throughout the state but rare or absent in the pine barrens of LI.

Distr in the Torrey Range. Common throughout the range in favorable situations except in the pine barrens of LI and in those of NJ and e and s of them.

Elevation. Grows to 2500 ft in Va.

Time of Fl. Early Apr-Jun; Apr-May at Cornell.

Origin. Native.

Marsh Marigold, or "Cowslip," as it is more popularly called in some regions (but not to be confused with the European Cowslip), was once extensively gathered in early spring and cooked for "greens," considered by many as one of our most excellent potherbs. As early as 1784, the Rev. Manasseh Cutler, a Massachusetts naturalist, spoke of it as an esteemed potherb; there is no doubt that it was then popular both in New England and in eastern Pennsylvania. Under no circumstances, however, should this plant be eaten raw; the fresh plant contains the poisonous glucoside helleborin, a substance that is expelled in boiling. In gathering Marsh Marigold for use as a potherb, great care should also be taken to exclude the False or White Hellebore, Veratrum víride (also called Bearweed and "Skunk Cabbage") and the Water Hemlock (Cicuta), both deadly poisonous plants that grow in habitats similar to those where Caltha abounds. These poisonous plants can easily be avoided by exercising due caution.

It is not necessary to pull up the whole plant when gathering a mess of Marsh Marigold greens; selected leaves can be cut from the plant with shears or a knife without injuring the plant. The new leaves should be carefully picked to exclude the stipules and mucilaginous bases, washed, then boiled thoroughly for half an hour, changing the water at least once. If a mild potherb is desired, the water should be changed twice, as the first water extracts only part of the acrid principle contained in the plant. Contrary to popular opinion, this hot-water treatment does not leach out all the vitamins and minerals; there is even some evidence that this blanching actually helps prevent those left from deteriorating. For those who do not like the slight pungency of the greens prepared as directed above, they can be creamed by combining 2 cups of the cooked, chopped greens with 1/2 cup of milk and 1 can of cream of mushroom soup. Cook and stir until all ingredients are thoroughly mixed and slightly thickened, then add salt and pepper to taste.

No conscientious forager wantonly destroys the native plants from which he is obtaining food, if for no other reason than the fact that his interests are best served by protecting his source of supply. Actually, the chief danger to the Marsh Marigold, as well as to a number of other plants, is not from the forager but from those who think that every marsh and swamp should be drained or filled in the name of "reclamation" with no regard for all the life forms that perish in the process, for men now not only change the face of the earth with their massive machinery in almost total ignorance of what they are actually doing but add insult to injury by labeling such actions "conservation" or "reclamation."

Curiously enough, Europeans have regularly considered their Marsh Marigold, identical in every respect to ours, as a poisonous plant and seem never to have utilized it as a source of greens. The only general use made of it in Europe was in the making of pickles from the unopened flower buds, considered "a fine substitute for capers." The tightly closed buds should be given the same double hot-water treatment described above for the leaves, then drained well and put in a pint jar. In a saucepan combine 1 cup of vinegar, 1/2 cup of water, 1/4 cup of sugar, 1 tablespoon of salt, and 1 teaspoon each of mustard seed and celery seed. Boil this mixture for 10 minutes, pour the boiling hot liquid over the buds, and seal the jar. Allow them to stand at least 1 month before using. Johnson (1867) states that "The juice of the petals boiled with alum furnishes a yellow dye."

Vogel (1970) does not mention this plant in his book on American Indian medicine, but Densmore (1928) reports that the Chippewas used the roots of Marsh Marigold in a decoction employed in the treatment of colds, scrofulous sores, and diseases of women, while a decoction of the leaves and stalks of this plant, together with those of some species of Ribes, were used to treat stoppage of urine. The roots of Marsh Marigold and Sanicula canadensis were combined and steeped to make a decoction taken internally during confinement. For colds, two roots were chopped and brought to a boil in a scant teacup of water. After the decoction was strained and cooled, the whole amount was taken at once. It was said to induce perspiration, loosen phlegm, and act as an emetic. A drink of warm water was given after the medicine had acted (presumably as an emetic), and, if necessary, the treatment was repeated five days later, but it was considered advisable to exercise caution, for "too much was an injury." Medicinal use of this herb was said to be a great secret. Indians of the southern Appalachians, however, regularly prepared Marsh Marigold as a potherb.

An infusion of the flowers of Marsh Marigold was in Europe once used as a medicine in the treatment of various kinds of "fits," both of children and adults, a term used for some of the convulsive disorders we now call epilepsy. It was also once thought to have expectorant and pectoral properties, considered a valuable ingredient in cough syrups. Small, well-diluted doses of a tincture prepared from the whole plant have also been given in cases of anemia, but Millspaugh (1887) remarks that "The medical history of this herb is very sparse and of no consequence; it has been used in cough syrups, which would, without doubt, have been fully efficacious without it." The whole plant is strongly irritant and cases are on record "of serious effects produced by rashly experimenting with it." On the other hand, when properly prepared for the table as "greens," in addition to containing high yields of vitamins A and C, it is rich in iron, an element necessary for building healthy red blood, a factor which made it useful in the treatment of anemia. The acrid, pungent juice of the Marsh Marigold has also been used in the treatment of warts. A drop of the caustic juice was squeezed from the leaf or stem onto the wart every day until it disappeared. Gibbons (1966) remarks that there are literally dozens of wart cures to be found in the old herbal literature, and it is difficult to determine when a wart has been cured by any treatment, but there is a theory that warts may be caused by a shortage of vitamin A in the diet. If this is true, the warts could be cured simply by eating Marsh Marigold greens.

This species has been the subject of early European reports of toxicity in man, cattle, and horses. In the United States Rafinesque reported that cattle browsing on this plant die in consequence of an inflammation of the stomach, but, owing to its acridity, farm animals will not ordinarily eat it. The dried plant appears to be harmless in hay, as the poisonous principle contained in the plant is volatile, but cattle, sheep, and horses have been poisoned by eating the fresh plant. In early spring, when other forage is scarce, it is therefore a wise precaution to keep farm stock away from areas where Marsh Marigold is growing, although young plants appear to be less poisonous than mature ones.

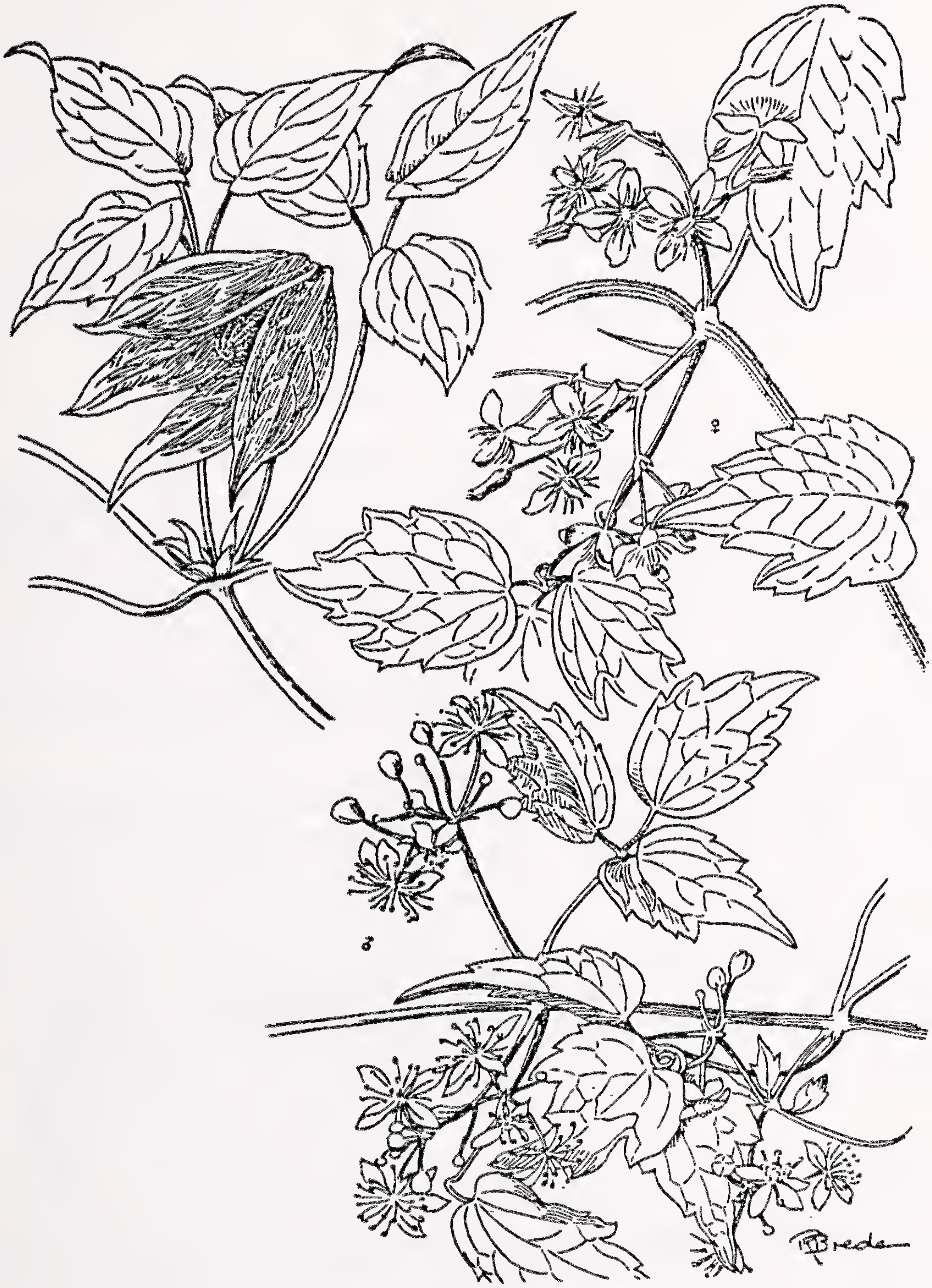
Marsh Marigold is quite common along the west branch of the Delaware river and in the marshes and streams draining into it, but for some obscure reason it appears to be extremely rare or absent from the east branch and its tributaries.

Clématis L. Clematis.

This is a genus of deciduous climbing vines containing more than 150 species widely distributed in temperate regions, chiefly in the northern hemisphere. Most of the species are shrubby climbers with compound, opposite leaves, the petioles of which, being sensitive to contact, act like tendrils, twisting around suitable objects and thus giving support to the plant. The fruit is a head of achenes, each of which bears a long-bearded, persistent style--an important agent in the distribution of its seeds by the wind. Clematis flowers have no true petals; their beauty rests in the colored sepals, of which there are usually four, but there may be as many as eight. *Klematis* was a name given by Dioscorides to a climbing plant with long lithe branches, from *klema*, a shoot, transferred by Linnaeus to this group of plants.

Horticultural interest in these plants centers largely in the numerous large-flowered varieties and hybrids that have been cultivated for many years. They make beautiful climbers for fences, arbors, porches, arches, and walls. *C. flammula* is noteworthy because of its delicious perfume. These large-flowered species commonly grown in gardens require pruning; because pruning requirements differ according to the type of plant, however, one should consult a nursery handbook for directions.

Clematis erecta, a European plant, has been used medicinally on the continent. When applied to the skin, the bruised leaves produce inflammation and vesication, hence the name *Flammula Jovis*, by which the plant was known in older pharmacy. It was considered useful in secondary syphilis,



(Left) Clematis occidentalis--Purple Clematis
(Right) Clematis virginiana--Virgin's Bower
[From Smith (1966), Plate 58, p. 136.]

cancerous and other foul ulcers, and severe headaches. It was given internally and at the same time the powdered leaves were applied to the surface of the sore. It also acted as a diaphoretic, but medicinal use of this plant was discontinued by the middle of the 19th century. Other species of clematis have the same acrid properties, including *C. virginiana*, which has been cited by authors as a proper substitute for *C. erecta*. *C. vitalba*, another European plant, has been used with success in the cure of itch. For this purpose the roots and stems, bruised and boiled for a short time to diminish their acrimony, were infused in boiling oil, which, thus impregnated, was applied to the skin several times a day. In New Zealand *C. paniculata* was also used as a counterirritant.

The young shoots of *C. flammula*, a native of the Mediterranean region, are reported as being edible, having been boiled as a potherb, but all species are best avoided both for medicinal use and as food plants. *C. vitalba*, Virgin's Bower, has been used as the source of a brownish-yellow dye.

Key to Local Species of Clematis

1. Flowers purple, 5-7.5 cm across, usually solitary on long peduncles.. *C. occidentalis*
1. Flowers white, about 2 cm across, in cymose panicles....... *C. virginiana*

Clématis occidentàlis (Hornem.) DC. Purple Clematis.

Meaning of Species Name. Western; i.e., the western hemisphere.
Synonyms. *C. verticillaris* DC. in Fernald (1950) and Gleason (1952).
Other Names. Mountain Clematis, Purple Virgin's Bower.
Type of Plant. A woody-stemmed climber.
Habitat. Rocky, often calcareous, slopes, open woods, and thickets.
Range. Que to Man, s to Del, Md, Va, WVa, O, Wis, ne Ia, and Mich.
Distr in NYS. Infrequent or rare across the state from Washington and Warren co, westw and s to the Hudson highlands; rare and local in the w part of the state.
Distr in the Torrey Range. NY: Not reported from LI nor SI, rare and local in Westchester co, thence increasing but not common northw.
Elevation. Sea level-3800 ft in the Torrey range.
Time of Fl. May-Jun; May 10-30 at Cornell.
Origin. Native.

Clématis virginiàna L. Virgin's Bower.

Meaning of Species Name. Virginian.
Other Names. Devil's-darning-needle, Woodbine, Traveler's-joy, Love-vine, Devil's-hair, Wild Hops.
Type of Plant. A perennial climbing woody-stemmed plant.
Habitat. Low grounds, thickets, fencerows, and borders of woods.
Range. NS and Que to Man, s to Ga, La, and Kan.
Distr in NYS. Common throughout most secs of the state, but largely absent from the pine barrens of LI.
Distr in the Torrey Range. Common throughout the range except in the pine barrens, there wanting.

Elevation. Grows to 2600 ft in Va and to nearly 3000 ft in the Adirondacks.

Time of Fl. Jul-Aug(Sep); Jul 20-Aug at Cornell.

Origin. Native.

Remarks. This species has sometimes been used medicinally in place of *C. recta*.

Muenscher (1949) states that dermatitis has been reported from handling *Clematis* leaves, but apparently few individuals are susceptible. This genus has a reputation for toxicity, for species native to other countries are strongly suspected of having caused livestock mortality, but no North American species has definitely been recorded as toxic to livestock in this hemisphere. All are apparently distasteful to farm animals, but Kingsbury (1964) remarks that "our *C. virginiana* may--rarely and under unusual circumstances--be dangerous to livestock."

Cóptis Salisb. Goldthread.

There are about 15 species of *Coptis*, low, evergreen bog and wet woodland plants that are natives of the temperate and arctic regions of the northern hemisphere. They are perennials with ternately divided radical leaves and small whitish scapose flowers. The name of the genus is derived from *kopteion*, to cut, and refers to the divided leaves. Thriving in moist, acid, peaty, or woodsy soils and in sandy soils in shaded locations, they are useful for woodland gardens, rock gardens, and bog gardens. The popular name is derived from the thin, creeping, gold-colored rhizome, which yields a yellow dye.

In India and China a similar species is much used as a tonic, especially for the stomach, and in Scind for inflammation of the eyes. A different species has been used in Japan for intestinal catarrh.

Cóptis trifòlia (L.) Salisb. Goldthread.

Meaning of Species Name. Three-leaved.

Synonyms. *C. groenlandica* (Oeder) Fern. in Fernald (1950).

Other Names. Canker-root, Mouth-root, Yellow-root.

Type of Plant. A perennial herb.

Habitat. Damp, mossy woods, swamps, and bogs.

Range. Gl to Ak, s to NJ, NC, Tenn, O, Ind, and Ia; also in e Asia.

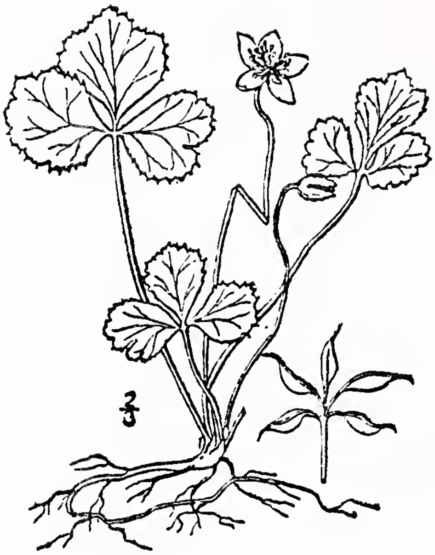
Distr in NYS. Common or frequent across the state northw, in c NY, and westw to L Erie; less common or local southw to the lower Hudson valley and in most of the s counties bordering on Pa; recorded from SI but not from LI.

Distr in the Torrey Range. NY: Unknown on LI; 2 records, not recently verified, from SI; rare and local in the Hudson valley below the highlands, thence increasing and common northw into the Catskills.

Elevation. Grows to 3500 ft in the Adirondacks; sea level-4020 ft in the Torrey range.

Time of Fl. May-Jun; May 10-30 at Cornell.

Origin. Native.



Coptis trifolia--Goldthread
[From Britton & Brown (1913), Vol. II, p. 88.]

Many Indian tribes used a decoction of the roots of Goldthread in the treatment of sore eyes, lips, cankers in the mouth, to soothe and heal the gums of teething babies, for use as an astringent mouth wash, and for the treatment of sore throat. Vogel (1970) reports that the Penobscots chewed the stems to cure canker in the mouth and considered it good for mouths irritated by too much tobacco smoking, while the Mohegans boiled the roots in water as a mild gargle. Not only was there a consistence in usage among many Indian tribes, but early settlers in America also made similar use of Goldthread, it being widely employed as a remedy in treating inflammations of the mucous membrane of the mouth and eyes. In 1779 J. Carver declared that this plant was "greatly esteemed both by the Indians and the colonists as a remedy for any soreness in the mouth, but the taste of it is exquisitely bitter." Samuel Stearns, writing in 1801, asserted that "A watery decoction, infusion and gargle of the roots, have been used by the Indian and white people to advantage, when sweetened with honey, against the canker in the mouth and throat; and some have chewed the root for the same purpose." In New England it was also valued as a local application in thrush, for children. Indians also used the roots as the source of a bright yellow dye, for the Chippewas boiled a large number of roots to produce a dye; the material to be dyed was boiled in the resulting dye bath.

The bitter principle in this plant also early suggested its use as a tonic to stimulate the appetite, for Goldthread roots furnish one of the purest, cleanest-tasting bitters to be found in all nature, with no nauseating properties and no astringency. Dr. Clapp called a dose of the powdered root a "pure, simple, strong bitter," with a great popular reputation, especially in New England, as an excellent tonic in the treatment of indigestion, dyspepsia, and general debility. It has therefore long been used as a bitter tonic to stimulate the appetite, considered especially valuable during convalescence, when nourishing food is needed and the appetite is inclined to be dull. The medicine was prepared by steeping 2 teaspoons of the finely chopped root in 1 pint of boiling water for 20 minutes, then straining off the liquid. To stimulate the appetite, 1 tablespoon of the infusion was taken 1/2 hour before meals; for sores in the mouth, as many as 6 tablespoons were taken during the course of the day. A taste for bitters must be acquired; they not only help to increase the appetite but also enhance the enjoyment of food. Our great-grandfathers much appreciated the use of bitters, but the practice of taking bitters before or during meals is much older, for the ancient Greeks and Romans considered bitters necessary to the full enjoyment of a meal.

The entire plant was official in the U.S. Pharmacopeia, 1820-82, and in the National Formulary, 1916-36, for use as a bitter tonic and for treating inflammations of the mouth and eyes. It contains the alkaloid berberine, which has a mild sedative action. The roots were collected in autumn, washed, and dried; in 1908 they brought from 60¢ to 70¢ a pound. Goldthread also once had a great reputation as a cure for alcoholism; a decoction of the bright yellow roots was reputed to destroy the taste for alcoholic beverages of all kinds and, combined with other herbs, it was part of the once-famous "Gold Cure" for problem drinkers.

Hepática Hill. Hepatica.

This is a small genus of some six species of early spring-flowering plants that grow wild in open woodland throughout the north temperate zone. The leaves persist during the winter, the new ones appearing after the flowers. Immediately beneath the flower are three leaflets (the involucre) simulating a calyx. Two varieties, among the earliest and best-known woodland wild flowers, occur in eastern North America; while both varieties often grow together in many localities, only one is common in the Catskills. The name of the genus is the feminine of the Latin hepaticus, the liver, for which, according to the doctrine of signatures, it was thought to have curative value because of the shape of the leaves. They are ideal plants for shady nooks in rock gardens or for planting in open woodland in leafy or peaty loam.

The European Liverleaf, H. nobilis, widely distributed in Asia and Europe, has held a place among medicinal plants from ancient times, and, at least to the middle of the 19th century, was much prescribed as a demulcent, tonic, astringent, vulnerary, and pectoral, employed in the treatment of coughs, hemorrhage of the lungs, and diseases of the liver. An infusion was usually made from 1 ounce of the dried herb to 1 pint of boiling water, of which doses of 1/2 teacupful were recommended. In some countries it was also valued in afflictions of the urinary passages and skin diseases. A distilled water was even employed for freckles and sunburn.

Key to the Catskill Varieties of Hepatica

1. Lobes of the leaf acute; length of the leaf blade about 3 times the distance from the summit of the petiole to the sinuses .... H. nobilis var. acuta
1. Lobes of the leaf blunt or rounded; length of the leaf blade about twice the distance from the summit of the petiole to the sinuses.................................. H. nobilis var. obtusa

Hepática nòbilis Schreb. var. acùta (Pursh) Steyer. Sharp-lobed Hepatica.

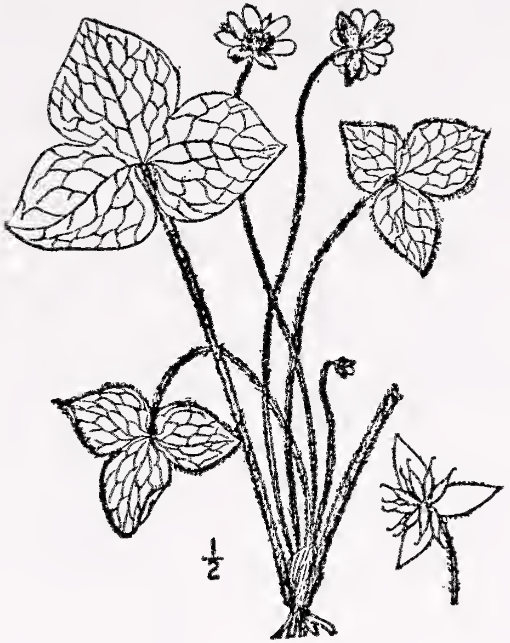
Meaning of Species Name. Famous; var. name, acute-lobed.
Synonyms. H. acutiloba DC. in Fernald (1950) and in Gleason (1952).
Other Names. Mayflower, Spring Beauty, Sharp-lobed Liverleaf, Hepatica, Liverwort, Squirrel-cup.
Type of Plant. A perennial herb.
Habitat. Rich dry or moist, often calcareous, upland woods.
Range. Que to Minn, s to Ga, Ala, and Mo.
Distr in NYS. Common or frequent in most secs of the state n of the coastal plain, and particularly abundant in calcareous secs.
Distr in the Torrey Range. NY: The Catskills.
Time of Fl. Mar-Apr; Mar 25-May 15 at Cornell.
Origin. Native.

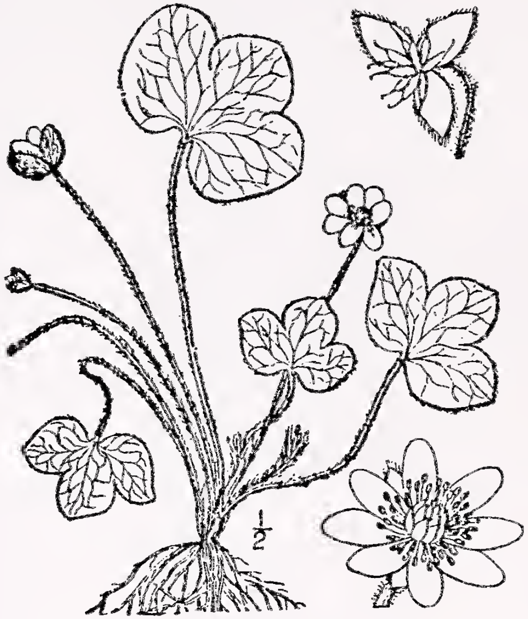
In North America the Indians considered both of our northeastern varieties, used practically interchangeably, as useful medicinal plants. Vogel (1970) states that the Potawatomis used the roots and leaves to make a sweet-tasting tea in treating dizziness, while the Cherokees used this plant for coughs either in tea or by chewing the root. The Menominees used this variety, in combination with roots of a maidenhair fern, to treat various female disorders. Whites used both leaves and roots in medicinal preparations. The editors of the 12th edition of the U.S. Dispensatory (1865) stated that "Liverwort is a very mild demulcent tonic and astringent, supposed by some to possess diuretic and deobstruent virtues," but even then it was falling into neglect. The dried leaves were official in the U.S. Pharmacopeia, 1831-82. In spite of the fact that this is no longer an official drug, Krochmal (1968) lists H. acutiloba as being in current demand by manufacturers of pharmaceutical products.

Hepática nòbilis Schreb. var. obtùsa (Pursh) Steyer. Blunt-lobed Hepatica.

Meaning of Species Name. Famous; var. name, American.
Synonyms. H. americana (DC.) Ker. in Fernald (1950) and in Gleason (1952).
Other Names. Liverleaf, Hepatica, Noble Liverwort, Mayflower, Three-leaf Liverwort, Liver-moss, Crystal-wort, Golden Trefoil.
Type of Plant. A perennial herb.
Habitat. Dry or moist and upland woods, preferring acid soil
Range. Que and NS to Minn, s to Fla, Ga, Tenn, Ala, and Mo.
Distr in NYS. Frequent or common across the state outside the higher Adirondacks, chiefly at low elevations and outside distinctly limestone formations.
Distr in the Torrey Range. Common throughout the range except in the pine barrens and s of the moraine on LI, there rare or wanting.
Elevation. Grows to 2600 ft in Va.
Time of Fl. Mar-Apr; Mar 25-May 15 at Cornell.
Origin. Native.

The Chippewas boiled the root of one plant in a quart of water for a decoction used to treat convulsions, chiefly for children. Millspaugh (1887) observes that "Liverleaf has held a place among medicinal plants from ancient times until the present. It is now falling into disuse on account of its mild properties, forming as it does simply a slightly astringent,





Hepatica nobilis var. acuta--Sharp-lobed Hepatica   Hepatica nobilis var. obtusa--Blunt-lobed Hepatica
[From Britton & Brown (1913), Vol. II, p. 101.]

mucilaginous infusion. It was used in hemoptysis, coughs, and other lung affections, as well as in all diseases of the liver and in hemorrhoids; in the latter troubles its exhibition must have met with no very flattering success. As a pectoral it may be taken in the form of an infusion, hot or cold, in almost any amount, as its virtues are not of a powerful or disturbing nature. The full-grown leaves of the year were collected for use in medicine."

This variety is rare in the Catskill region. From the habitat preferences given in the botany manuals and other sources for this and the preceding variety, however, one would think that var. obtusa, which is supposed to prefer an acid soil, would be the prevailing species in this area, when, as a matter of fact, records for this variety in the Catskills are extremely sparse. After more than 20 years of diligent search, the writer was beginning to feel that var. obtusa was the figment of someone's overactive imagination when he finally located the plant in the very heart of the Catskill region. In this case it was not a question of the species having been overlooked, as might happen with a number of other plants.

Ranúnculus L. Buttercup.

This genus contains about 300 species of nearly worldwide distribution in most temperate countries of both hemispheres, extending into arctic regions and appearing on the higher mountains of the tropics. They constitute a group of more or less hardy, acrid, herbaceous plants, sometimes with the base of the plant enlarged to form a kind of tuber, as in R. bulbosus. Some species are among the commonest weeds of roadsides, meadows, pastures, and marshy places. The name of the genus is the ancient Latin name of these plants, literally "a little frog"(the diminutive of rana, a frog), applied to these plants by Pliny in allusion to the aquatic habitat of some species. Although most species common in the Catskills can be recognized at a glance, well-developed achenes are necessary for proper identification of others, and note should be made of the character of the roots and the habit of the lower part of the stem. About 70 species are native to North America, but a number of species have also been introduced from Europe, and some are considered to be indigenous to both continents.

All members of this genus are relatively poisonous, the acrid juice of many species being powerful enough to raise blisters on the skin, a characteristic well known to the ancient physicians, who generally applied it externally as a counterirritant. If the fresh leaves are eaten, severe inflammation of the intestinal tract may result, which has sometimes terminated in death. On the other hand, many species have in the past been used as potherbs, particularly in times of scarcity, for the process of boiling dispels the volatile acrid principle and renders them edible, although cases have been reported "where this happy result failed, and serious symptoms supervened." In northern Persia and Asia Minor, the young tubers, leaves, stems, and blossoms of R. edulis, Egg-yolk (so called because of the yellow color of the flowers), were taken to market as a potherb at least until the beginning of the present century. In Europe R. bulbosus, R. ficaria, R. repens, and even R. sceleratus have been used as food in the spring, particularly when combined with other potherbs. Since so many other more palatable plants are equally available at most seasons of the year, however, buttercups can hardly be recommended even as an emergency food. At least one of the yellow-flowered species is reported as a source of a musk-colored dye.

This group of plants is highly valued by the gardener as the source of a varied number of easy-to-grow plants of considerable decorative value. R. asiaticus, a native of the Levant, is remarkable both for the range of colors exhibited by its flowers (yellow to purplish-black) and for the regularity with which the stamens and pistils are replaced by petals, forming double flowers. Other horticultural species include R. aconitifolius, Fair-Maids-of-France, a lovely European plant of alpine marshes; a double-flowered variety of R. acris, sometimes called Yellow Bachelor's-buttons, useful both in the flower border and for cutting; R. amplexicaulis, perhaps the most beautiful of the white mountain buttercups; and even our native R. trichophyllus, White Water-crowfoot, a charming plant for growing in the shallow water of ponds and slow-moving streams, where in spring its numerous white flowers resemble miniature water-lilies.

Various members of this genus were well known to the ancient physicians; Dioscorides used them as external applications for the removal of psora and tumors and as fomentations in the treatment of chilblains and toothache. Galen, Paulus, and Arabian physicians all spoke highly of them as powerful escharotics, and the Bedouins used them as rubefacients. According to Millspaugh (1887), "The general and medical history of the species is generic," R. acris, R. bulbosus, R. repens, R. flammula, and R. sceleratus having been used almost interchangeably. The latter, however, being more caustic than some of the others, was generally the species used in European medicine, but they were employed with caution. Even Gerard remarked that "most are very dangerous to be taken into the body." "Not any of them are to be taken alone by themselves," but he admitted that "these dangerous simples are likewise many times of themselves beneficial ..., for some of them are not so dangerous but that they may in some sort and oftentimes in fit and due season profit and do good." But he could not refrain from remarking on a non-medical use commonly made of these plants in his time: "Cunning beggars do use to stampe the leaves and lay it unto their legs and armes, which causeth such filthy ulcers as we daily see (among such wicked vagabondes), to moove the people the more to pittie," afterward, according to one report, curing these sores by applying fresh Mullein leaves.

In former medical practice Millspaugh reported that the plants were used externally in the treatment of rheumatism (especially sciatica), hip diseases, pains, asthma, and pneumonia. Some species were even occasionally prescribed for internal use. Speaking of R. flammula, one authority stated that "It is an instantaneous emetic, as if Nature had furnished an antidote to poisons from among poisons of its own tribe; and it is to be preferred to almost any other vomit in promoting the instantaneous expulsion of deleterious substances from the stomach." But the uncertainty of their action and the occasional violent allergic reactions of some individuals even when applied externally, made most physicians extremely cautious in using members of this genus. Oil of ranunculus, which was at one time considered to constitute the active principle of these plants, acted as an acrid narcotic when taken internally, in small doses producing stupor and slow respiration; in larger doses, it resulted in paralysis, convulsions, and death. Some care should be exercised even in casually handling these plants, as the juice of some of our common buttercups will raise blisters on the skin of many individuals who come in contact with them.

The American Indians also made medicinal use of several species of buttercups. Vogel (1970) states that the entire plant of *R. pensylvanicus* was used as an astringent by the Potawatomis, and the Meskwakis used the flowers of *R. delphinifolius*, the Yellow Water-crowfoot, as a snuff to cause sneezing, and, mixed with other herbs, as a medicine for treating catarrh and head colds. Illinois Indians are also reported to have used the pulverized roots of a native species, soaked in warm water, as a wash to treat wounds and cuts. Medicinal use of species of *Ranunculus* was not limited to Europe and North America. Natives of New Zealand used the sap of *R. rivularis* to treat rheumatism and disorders of the joints, while an infusion of the leaves was used for quinsy. They also used the whole plant of *R. hirtus*, presumably as an infusion, in treating inflamed eyes, toothache, and abrasions.

Buttercups are strongly distasteful to farm animals and will be rejected so long as better forage is available, but poisoning has been observed in all classes of livestock, particularly among horses, goats, and pigs. Cows poisoned by buttercups may produce bitter milk or milk with a reddish color. In severe cases the animal dies following convulsions, but buttercup poisoning is rare. Dried buttercups in hay, on the other hand, are harmless; since the poisonous principle is volatile, it is driven off when the hay is cured. Hay containing dried buttercups can therefore be fed to cattle without harm, but such hay is undoubtedly of inferior quality.

Although buttercup seeds (achenes) are consumed by several kinds of birds and rodents, the amounts eaten are generally small. Martin *et al.* (1961), however, list the wood duck, wild turkey, snow bunting, and the black-tailed deer of California as finding them of considerable interest.

Key to the Catskill Species of Ranunculus

1. Petals white; plants aquatic, the leaves submersed, dissected into filiform or narrowly linear segments............ *R. trichophyllus*

1. Petals yellow; plants terrestrial, 2

  2. Sepals normally 3, rarely 4 (leaves simple; flowers 2.5-4 cm wide; an old garden plant locally escaped)............. *R. ficaria*

  2. Sepals usually 5, rarely more, 3

    3. Achenes turgid, without a sharp or winglike differentiated border; basal leaves usually merely crenately toothed, occasionally some of them lobed, but always very different in form from the sessile or subsessile cauline leaves, 4

      4. Beak of the achene nearly straight, about 0.2 mm long (leaves and young stems glabrous or nearly so)..... *R. abortivus*

      4. Beak of the achene strongly curved or hooked, 0.7-1 mm long.................................... *R. allegheniensis*

    3. Achenes flattened, with a sharp differentiated border paralleled by a nerve on each face; basal leaves all or nearly all compound, 5

      5. Terminal segment or lobe of the principal cauline leaves not stalked, usually connected with the lateral segments by leaf tissue, 6

    6. Petals 3.5-6 mm long, about equaling the sepals; beak of achene long, strongly hooked (heads subglobose); a woodland plant.. *R. recurvatus*
    6. Petals 8-16 mm long, about twice as long as the sepals; beak of achene straight or slightly curved; a plant of open fields and roadsides (leaves circular in outline, with all divisions sessile, palmate; receptacle glabrous, except sometimes at tip).................................... *R. acris*
5. Terminal segment or all segments of the principal leaves stalked, 7
    7. Style elongate, nearly straight, stigmatose only at the apex (stem soon developing trailing or prostrate leafy branches rooting from the nodes; achenes 3.3-4 mm broad; styles over half the length of achene). *R. hispidus* var. *caricetorum*
    7. Style short and stout, outwardly curved, stigmatose along the inner (upper) side (visible under a 10X lens), 8
        8. Sepals promptly and tightly reflexed; stem erect, bulbously thickened at base; basal leaves oval in outline; spring flowering.............................. *R. bulbosus*
        8. Sepals spreading; stem usually creeping, rarely erect, not bulbous at base; basal leaves usually round in outline, ternately divided into mostly petiolulate leaflets; summer flowering (achenes 2-2.5 mm broad; styles more or less curved, half the length of the achene or less)... *R. repens*

Ranúnculus abórtivus L. Kidney-leaved Crowfoot.

Meaning of Species Name. Abortive, i.e., with reduced styles and petals.

Other Names. Kidney-leaved Buttercup, Small-flowered Crowfoot, Smooth-leaved Crowfoot, Small-flowered Buttercup.

Type of Plant. A biennial herb, reproducing by seeds.

Habitat. Low woods, thickets, clearings, pastures, and damp slopes.

Range. Lab to Ak, s to Fla, Tex, and Col.

Distr in NYS. Common.

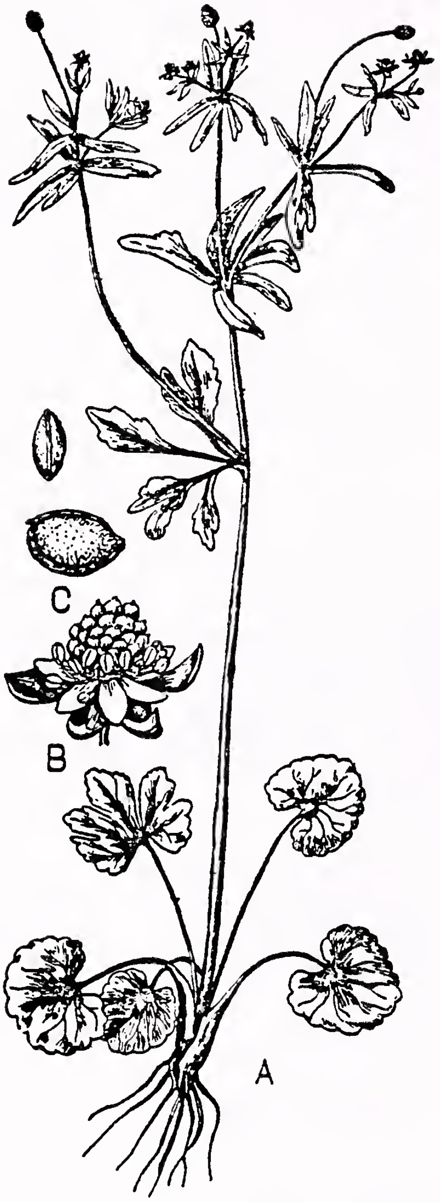
Distr in the Torrey Range. Common throughout the range except in the pine barrens, there wanting; doubtfully n of the moraine on LI.

Elevation. Collected at 3365 ft in Delaware co.

Time of Fl. Apr-May(Jun); May at Cornell.

Origin. Native.

This species can usually be distinguished from other buttercups by its flowers, the receptacle of which is elongate; by its inconspicuous petals, which are equal to or smaller than the sepals; and by its usually crenately toothed, undivided basal leaves. It closely resembles *R. allegheniensis*, a plant of similar habitats, but the beaks on the achenes of the latter are strongly hooked. There is one record of the aboriginal use of the root of this species as a styptic to stop nosebleed. While the Iroquois generally regarded this plant as being acrid or poisonous, Herrick (1978) states that it was thought to "Cure or prevent snake bites and spider bites" as well as "Cure paralysis, dizziness, convulsions, epilepsy, or alcoholism, ... vague, internal pains; swellings; sore eyes; blindness;



Ranunculus abortivus--Kidney-leaved Crowfoot
[From Muenscher (1952), Fig. 38, p. 242.]

cysts, boils, pimples, and piles"; in addition, it was "thought to be effective in curing or preventing certain severe, English-named diseases," such as smallpox, cancer, tuberculosis, and syphilis. It has been suspected in a case of cattle mortality in Virginia, but Kingsbury (1964) remarks that feeding experiments under somewhat less than ideal conditions were negative.

This weed is rather common in shady and moist places. Like most of the buttercups it appears early, in some places becoming an undesirable spring weed, especially in wet meadows and pastures. Muenscher (1952) suggests that one should plow badly infested fields and follow by a clean cultivated crop. Badly infested lawns should be plowed if possible before the plant blooms; meadows and pastures should be mowed close as soon as the first flowers appear.

Ranúnculus àcris L. Tall Field Buttercup.

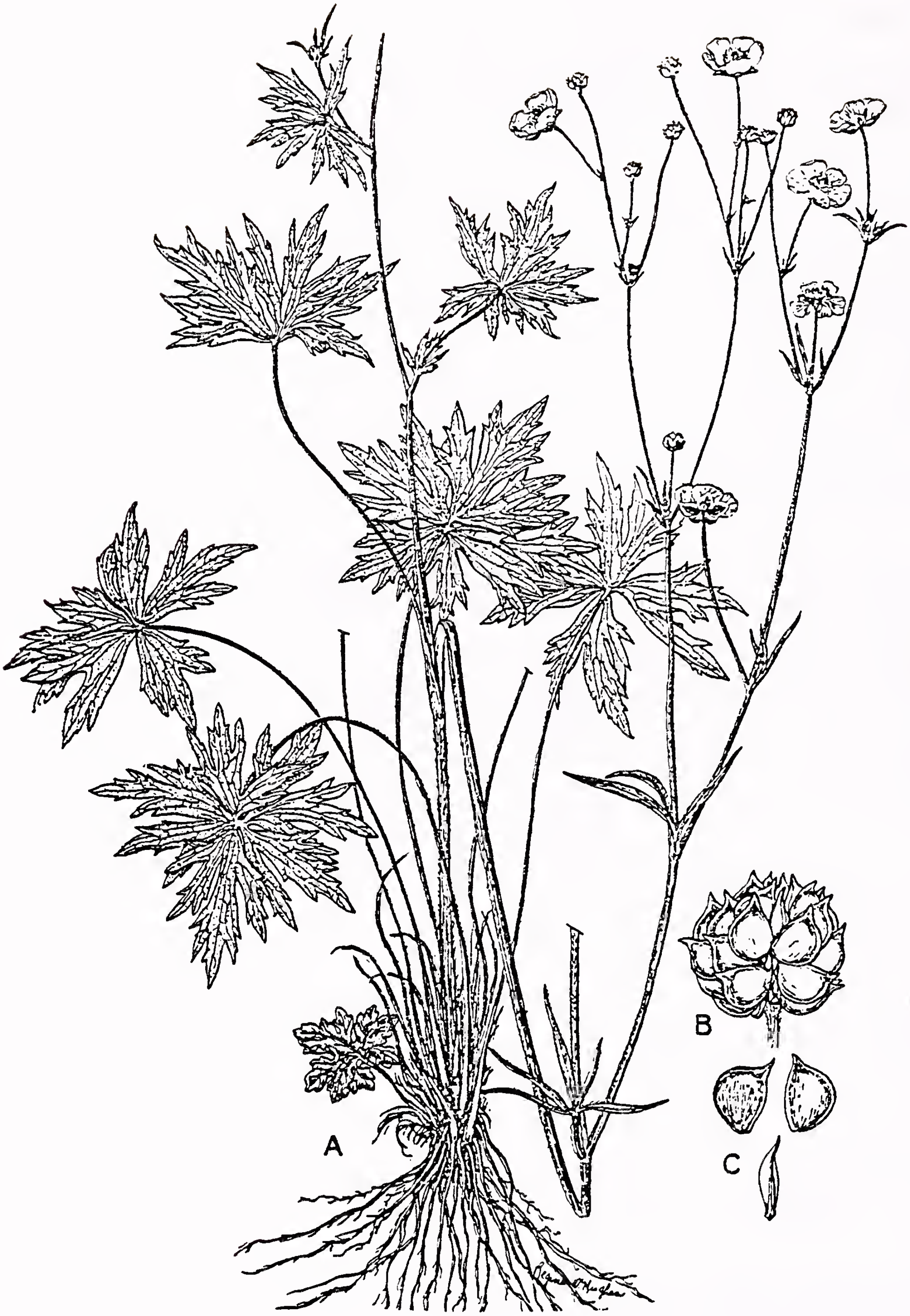
Meaning of Species Name. Acrid.
Other Names. Common Buttercup, Meadow Buttercup, Yellow Gowan, Butter-rose, Butter-cresses, Butter-daisy, Borse-gold, Bachelor's-buttons, Blister Plant, Tall Crowfoot, Butter Flower, Gold Cup.
Type of Plant. A perennial herb, reproducing by seeds.
Habitat. Fields, meadows, clearings, roadsides, and waste places.
Range. Lab to Ak, s to NC, WVa, O, Ind, Ill, Mo, Kan, and Ore.
Distr in NYS. Common.
Distr in the Torrey Range. Common throughout the range.
Elevation. Collected at 2900 ft in Greene co.
Time of Fl. May-Aug(Sep); Jun 15-Jul 15 at Cornell.
Origin. Natzd from Eu.
Remarks. A ubiquitous weed of the northeastern states and s Canada.

This species has been used as a dye plant in Scotland and the Outer Hebrides, where the tips of the plant were boiled with wool, after which baking soda was added to obtain a purple color.

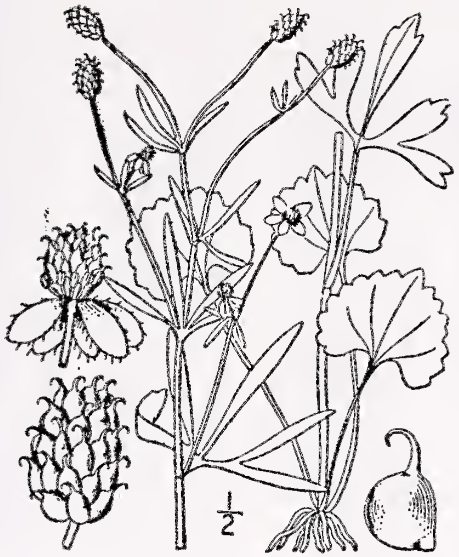
The medical history of the different species of Ranunculus is generic rather than specific, several of the species being used practically interchangeably, so this plant was used in much the same way as was R. bulbosus. The juice of the leaves has been used to take away warts, and a plaster made of them was sometimes used in the treatment of violent headaches. The fresh leaves also once formed part of a famous cure for cancer in the 18th century, and they were likewise sometimes used in the treatment of gout, reportedly "with great success." The Montagnais Indians of Newfoundland and Nova Scotia crushed the leaves of this species in their hands and inhaled the odor from their palms to relieve headache.

Most of the buttercups are known to be acrid, but this one received its specific Latin name from its intense acridity. Cattle will not readily eat it in the green state unless driven to it by hunger. According to Linnaeus, sheep and goats will eat it, but cattle, horses, and pigs refuse to touch it; on the other hand, it has been considered responsible for poisoning of pigs in Illinois. Its very acrid juice acts as an irritant when eaten by farm stock, often blistering the mouth and producing symptoms of severe gastro-intestinal irritation. Since this species is abundant in pastures and meadows throughout the northeastern states, it is probably the cause of most cases of buttercup poisoning among farm animals in that area. Milk from cattle that have eaten this plant becomes bitter or tainted, a taste that persists in butter made from the milk. When made into hay, however, it loses its acrid quality and is safe to eat, but these plants are too hard and stalky to yield much nourishment.

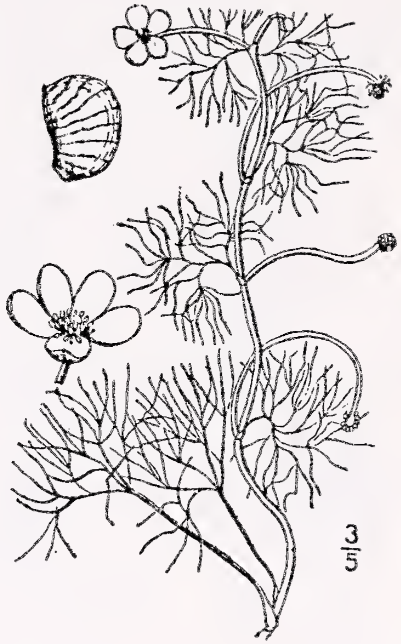
Because few animals will touch this plant, its freely produced seeds are widely scattered and the plant often becomes a noxious weed, overrunning meadows and pastures, practically throughout the United States and southern Canada. Since it thrives best in heavy, wet soil, the first step in bringing this weed under control is to improve the drainage. In addition, since it will not persist in cultivated areas, Muenscher (1952) suggests that badly infested meadows should be plowed, followed by clean cultivation for a year. Infested pastures present a rather more difficult problem; where possible,



Ranunculus acris--Tall Field Buttercup
[From USDA Agr. Research Sv. (1971), Fig 91, p. 187.]



Ranunculus allegheniensis--Mountain Crowfoot
[From Britton & Brown (1913), Vol. II, p. 110.]



Ranunculus trichophyllus--White Water-crowfoot
[From Britton & Brown (1913), Vol. II, p. 116.]

they should be fertilized and harrowed in spring. In other areas the clumps of buttercups should be mowed or cut off as soon as the first flowers bloom and again when the second crop appears.

Ranúnculus alleghéniensis Britt. Mountain Crowfoot.

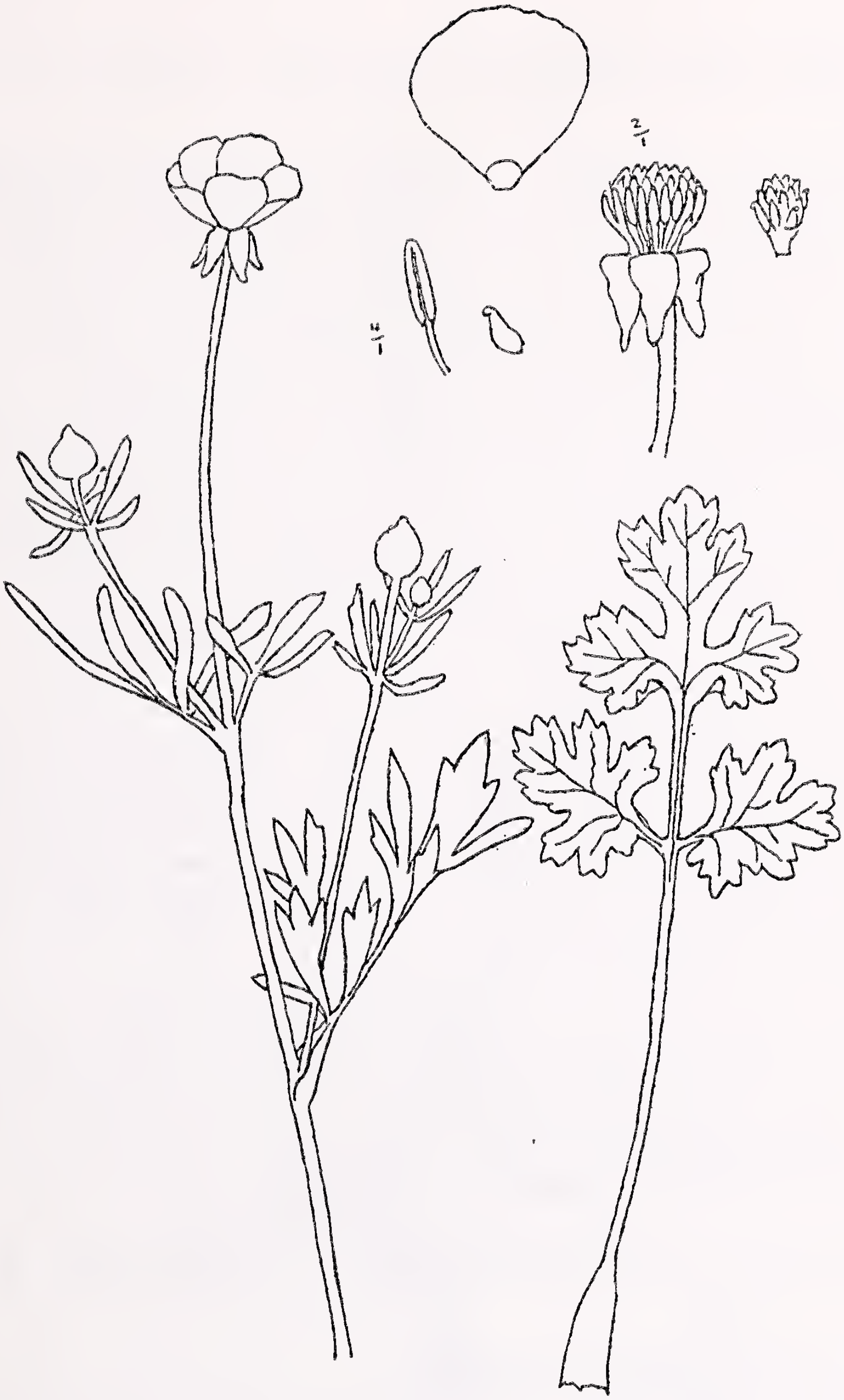
Meaning of Species Name. Of the Alleghenies.
Other Names. Alleghenian Crowfoot.
Type of Plant. Probably a biennial herb.
Habitat. Rich woods and rocky, calcareous or basic slopes, rarely in meadows.
Range. Chiefly in the mts, Mass and Vt, s to SC, Tenn, and O.
Distr in NYS. Frequent in the Hudson valley and the s counties of the state, westw to L Erie.
Distr in the Torrey Range. In 1915 known only from Litchfield co, Ct, there rare; reported but not definitely known from the Catskills.
Time of Fl. Late Apr-May(Jun).
Origin. Native.
Remarks. The strongly hooked beak of the achene will distinguish this species from R. abortivus.

Ranúnculus bulbòsus L. Bulbous Buttercup.

Meaning of Species Name. Bulbous
Other Names. Bulbous Crowfoot, Yellow-weed, Butter-flower, Blister-flower, Frogwort, Pilewort, Horse-gold, Frog's-foot, St. Anthony's Turnip.
Type of Plant. A perennial herb.
Habitat. Pastures, fields, lawns, meadows, open woods, and roadsides.
Range. Nf to Ont, s to Ga and La.
Distr in NYS. Frequent in many secs of the state.
Distr in the Torrey Range. Common everywhere.
Time of Fl. Apr-Jun; May 15-Jun 15 at Cornell.
Origin. Natzd from Eu.

This species is similar in many respects to the Tall Field Buttercup, but it can be distinguished by its earlier period of flowering, the shape of its basal leaves, and by the presence of a distinct swelling of the stem just above the root system, forming a sort of bulb.

Like most of the buttercups, this species also possesses the property of inflaming and blistering the skin; it, together with R. acris, R. repens, and R. sceleratus, was therefore once much used almost interchangeably with them as counterirritants in medicine, with R. sceleratus being favored in Europe and R. bulbosus in this country; the latter, one of the more acrid of the genus, was the only one designated as official in the U.S. Pharmacopeia, 1820-82, both the root and the body of the plant being used. The juice of this plant, particularly of the roots, was said to raise blisters with less pain and greater safety than Spanish fly and was successfully used in the treatment of gout, for which it was applied to the joints. The juice, applied to the nostrils, also had a reputation for curing certain types of



Ranunculus bulbosus--Bulbous Buttercup
[From Stone (1945), Vol. I, p. 606.]

headache. The crushed leaves were likewise used to produce blisters on the wrists in the treatment of rheumatism and, when infused in boiling water, used as a poultice at the pit of the stomach. This plant seems never to have been prescribed for internal use in the United States, but Grieve (1967) reported that in England 6 to 8 drops of a tincture made with spirits of wine was prescribed three or four times a day in the treatment of shingles, expeditiously relieving the outbreak of the small pimples and the accompanying sharp pains between the ribs. This tincture was also employed in the treatment of sciatica "with good effect."

But the use of this plant, as well as of other species of Ranunculus, had some distinct disadvantages. As reported by the U.S. Dispensatory of 1865, "the uncertainty and occasional violence of its action have nearly banished it from regular practice." On some individuals it seemed to have scarcely any effect while on others it not only acted speedily but excited "extensive and troublesome inflammation" which sometimes terminated "in deep obstinate ulcers," from which gangrene occasionally resulted. Although some species of buttercups acted as prompt and powerful emetics, the fresh juice of R. bulbosus was never used internally. If swallowed in the fresh state, it produced severe pain and inflammation in the stomach which could end in death. In addition, it was also reported to have narcotic properties, diminishing the frequence of the pulse and respiration. In spite of its drawbacks, however, it was for many years retained in the pharmacopeia, "as occasions may happen when the practitioner in the country may find advantage in having recourse to its powerful rubefacient ... operation." The fresh herb was official for external use only as a counterirritant.

The round "bulbs" which have wintered over are in the spring reported to be surprisingly mild and sweet, with no more pungency than a somewhat strong radish. When thoroughly dried, they lose essentially all their acridity and become very sweet. In 1789 J. Lightfoot stated that "Not withstanding this corossive quality, the roots when boiled become so mild as to become eatable." They have therefore been used as an emergency food in some areas, but, as remarked above, in this country at least, other and more attractive emergency foods are available during the spring. This species has also been used as a source of "vigogna" dye.

Pigs are reported to be remarkably fond of the "bulbs" of this species and "will go long distances to get them," yet Kingsbury (1964) states that this species was considered responsible for a case of poisoning in hogs in which the chief symptom was blindness. In England one case is reported of children being poisoned from eating the bulbous portion of several plants, mistaking them for Pignuts (Chenopodium majus).

In areas where this species has become an obnoxious weed, it can be controlled by the same methods as those outlined for R. acris.

Ranúnculus ficària L. Lesser Celandine.

Meaning of Species Name. An old generic name, from Ficus, Fig, alluding to the tuberous roots, which resemble fig-warts.

Other Names. Pilewort, Small Celandine, Figwort, Smallwort.

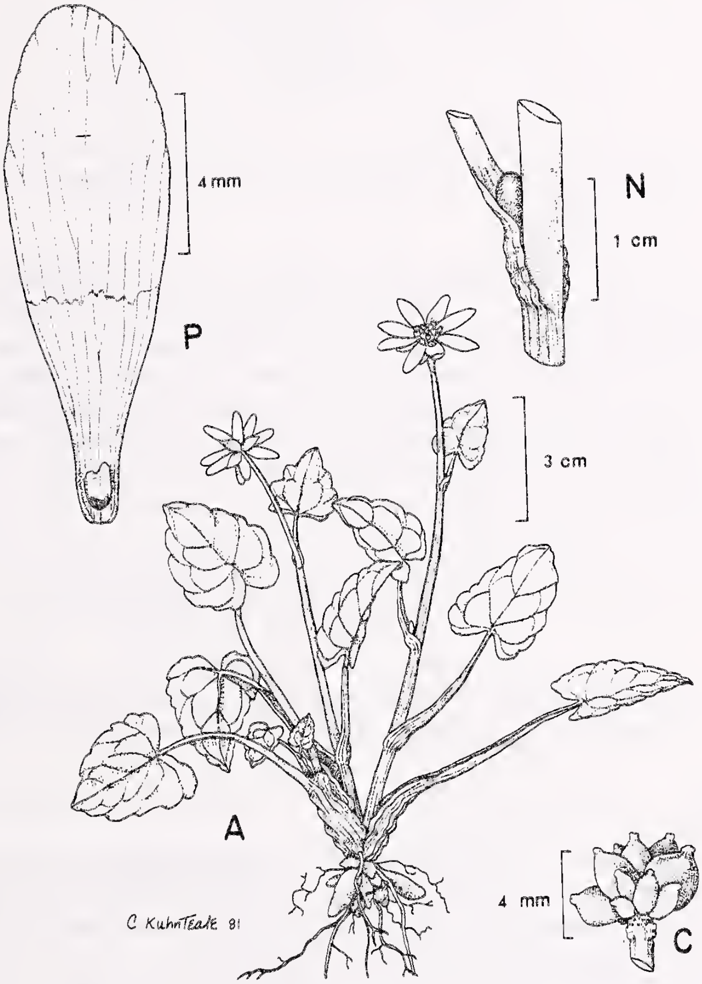
Type of Plant. A perennial herb.

Habitat. Waste places and open woods.

Range. An old garden plant locally est at several stations from Mass to DC.

Distr in NYS. Locally adv on LI and SI; not recently collected.

Distr in the Torrey Range. In 1915 known only from Flushing and College Point, LI, SI, and Delaware and Philadelphia co, Pa.



Ranunculus ficaria--Lesser Celandine
[From Mitchell & Dean (1982), p. 38.]

Time of Fl. Apr-May(Jun).
Origin. Introd from Eu.

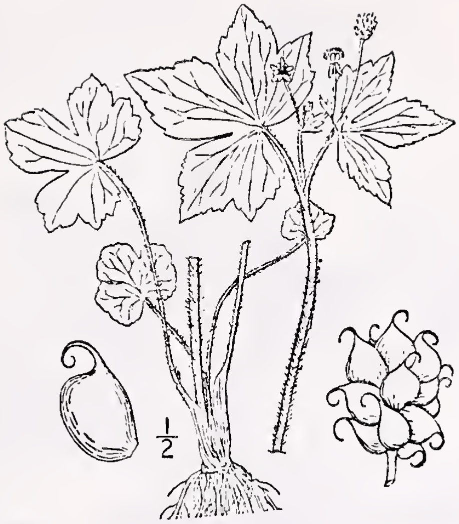
In Europe this species was collected in early spring while in flower and dried for medicinal use as an astringent. It was an old remedy for piles that, according to Grieve (1967), "has recently been reintroduced into the British Pharmacopoeia, and is considered almost a specific." An infusion of 1 ounce of the dried plant in a pint of boiling water is prescribed in wineglassful doses to effect a cure. It was also used externally as an ointment, made from the bruised herb with fresh lard, applied locally night and morning.

This plant has recourse to a method of reproduction independent of all external aid. At the point where the upper leaves join the stem are to be seen little objects like minute round tumors, which grow about the size of a grain of wheat. In early summer, when the leaves and stems are dying down, these "grains" become loose and drop to the ground; each is capable of producing a new plant. These bulbils are produced only on those plants whose fruits have failed to set. Seedlings do not flower in their first year but collect and store up material to start their accustomed course at the end of the ensuing winter.

The young leaves, the substance of which is soft and mucilaginous. have sometimes been boiled and eaten as a vegetable in Sweden, but they do not have the reputation of being very palatable, either thus treated or raw as a salad. Linnaeus advised farmers to eradicate the plant from their land on account of its being disliked by cattle (though wood pigeons eat it with avidity), also for its injurious effect on other herbs in the meadow, but there seems little reason for this assumption, as the acrimony of the Lesser Celandine is of a very mild character.

Ranunculus hispidus Michx. var. caricetorum (Greene) Duncan. Swamp Buttercup.

Meaning of Species Name. Bristly; var. name, growing among sedges.
Synonyms. R. septentrionalis Poir. in Fernald (1950) and in Gleason (1952).
Other Names. Marsh Buttercup.
Type of Plant.· A perennial herb.
Habitat. Alluvial thickets, wet woods, swamps, and wet meadows.
Range. Lab to Ont and Man, s to Md, Va, WVa, Ky, Ark, Mo, and Tex.
Distr in NYS. Frequent or common across the state, chiefly outside the higher Adirondacks, southw to n LI.
Distr in the Torrey Range. NY: Rare and local on LI and SI, frequent in Westchester co, thence increasing and becoming very common northw.
Elevation. Sea level-2100 ft in the Torrey range.
Time of Fl. Apr-Jun(Jul); May-Jun at Cornell.
Origin. Native.



Ranunculus recurvatus--Hooked Crowfoot
[From Britton & Brown (1913), Vol. II, p. 111.]

Ranúnculus recurvàtus Poir. Hooked Crowfoot.

Meaning of Species Name. Bent backward, referring to the styles.

Other Names. Rough Crowfoot, Hooked Buttercup.

Type of Plant. A perennial herb.

Habitat. Moist or dry but usually damp or swampy rich woods and shaded brooksides.

Range. Nf to Man, s to Ga, Ala, Miss, La, Okla, and e Tex.

Distr in NYS. Common or frequent in most secs of the state.

Distr in the Torrey Range. Throughout the range except in the pine barrens, there wanting.

Elevation. Grows to 4200 ft in NC.

Time of Fl. (Apr)May-Jun(Jul); May-Jun at Cornell.

Origin. Native.

Ranúnculus rèpens L. Creeping Buttercup.

Meaning of Species Name. Creeping.

Other Names. Gold-balls, Ram's-claws, Butter-daisy, Horse-gold, Sitfast, Spotted-leaf Buttercup, Clinton's Buttercup.

Type of Plant. A perennial herb, reproducing by seeds and runners.

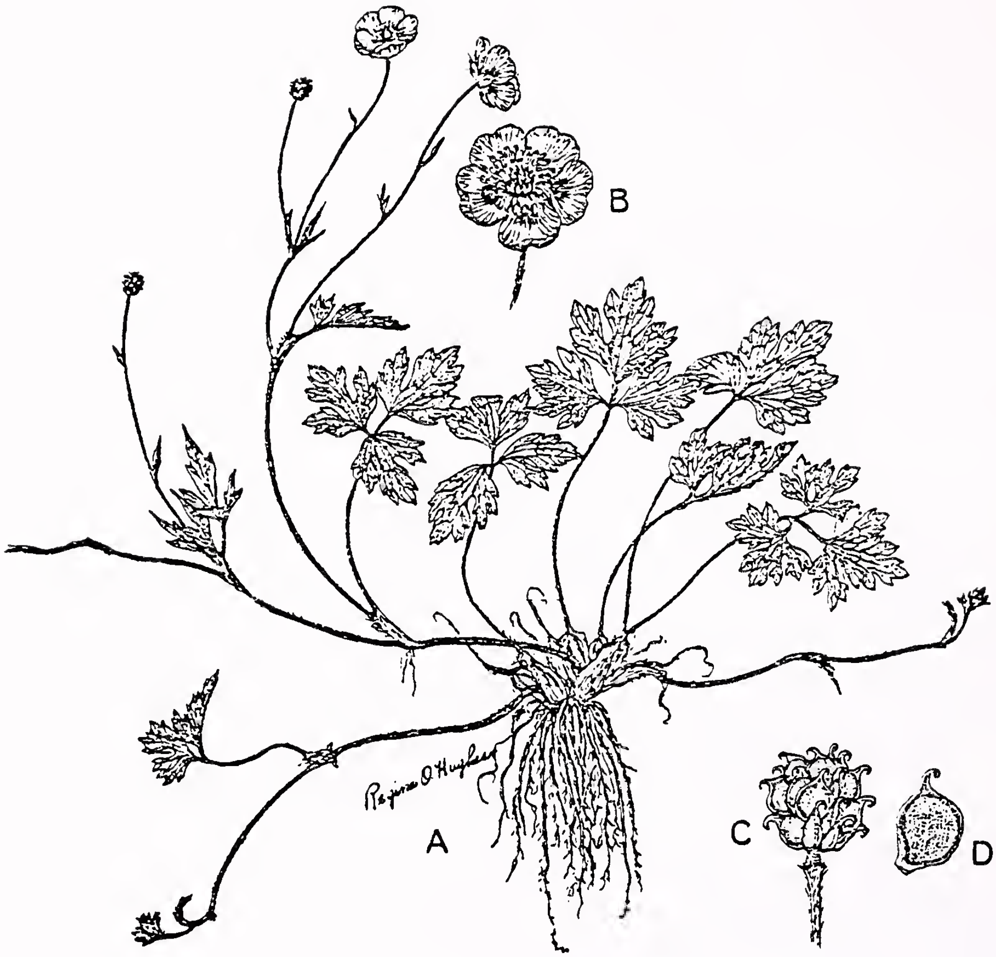
Habitat. Wet open or shady ground, fields, lawns, roadsides, and wet meadows.

Range. Nf to Minn, s to NC, WVa, Ky, and Mo; also in the w from Ak to Col and Cal.

Distr in NYS. Frequent across the state outside the Adirondacks and the higher Catskills.

Distr in the Torrey Range. Occasional as an adv over most parts of our range except in the pine barrens, there unknown.

Time of Fl. May-Jul; Jun at Cornell.

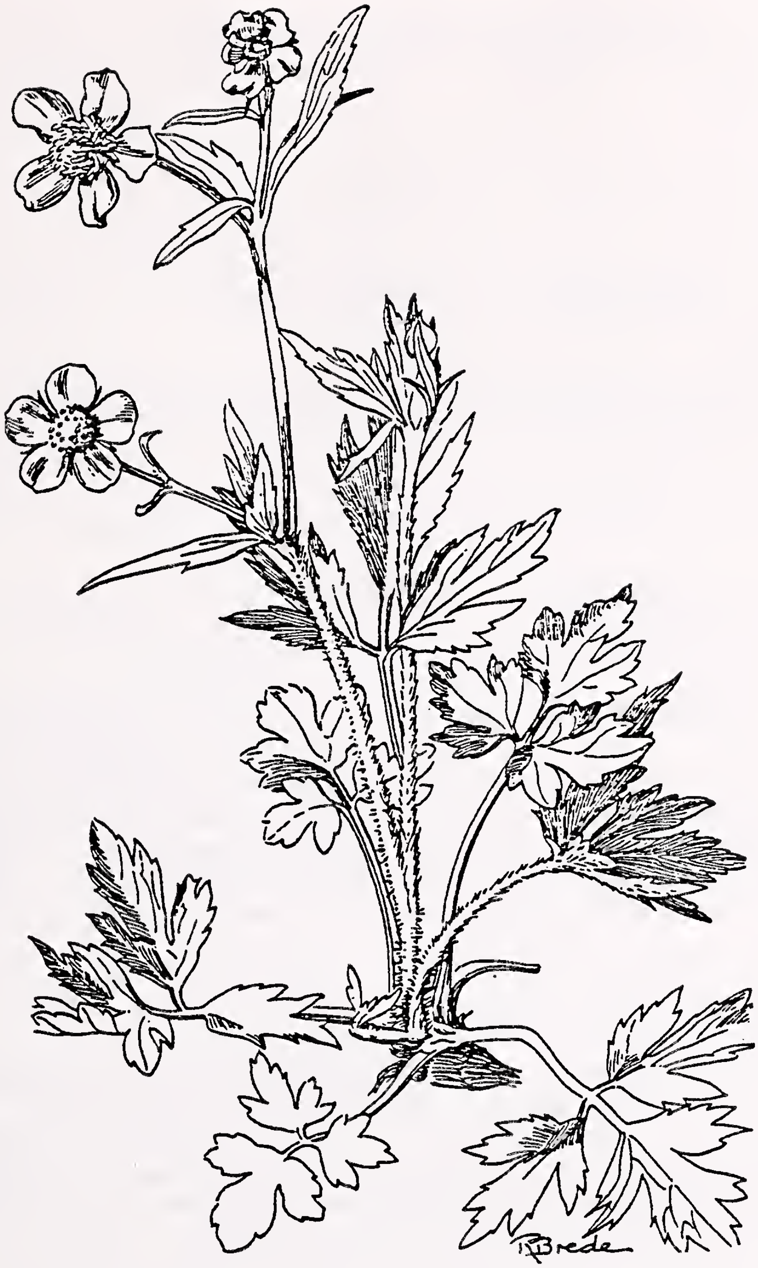


Ranunculus repens--Creeping Buttercup
[From USDA Agr. Research Sv. (1971), Fig. 92, p. 189.]

Origin. Natzd from Eu.
Remarks. A rapidly spreading weed; more abundant northw.

Young plants of this species sometimes lack creeping stems, making it difficult to distinguish them from R. hispidus var. caricetorum. The leaves of R. repens are often mottled with white and are usually a darker green; in addition, the hairs on the stems and petioles are usually appressed in this species. If the plant is in bloom, differences in the pistils will serve to separate them; in R. repens the short (0.5-1 mm long) style ends in a small hook, the stigmatic portion being 0.4-1 mm long and nearly covering the inner (upper) side. In the Swamp Buttercup, on the other hand, the long (1.5-2 mm) style is straight or only slightly curved, the stigmatic portion at the tip measuring only 0.2-0.5 mm long.

This is a plant of wet meadows, pastures, moist lawns, and roadside ditches, scattered practically throughout the northern half of the United States and north into Canada, particularly aggressive in western Oregon, Washington, and British Columbia. Although growing partly erect, plants of this species have a common habit of producing long stems that trail over the ground, rooting at the nodes. Frequent reports of poisoning incriminating



Ranunculus hispidus var. caricetorum--Swamp Buttercup
[From Smith (1966), Plate 50, p. 122.]

this species have been received by the Oregon Agricultural Experiment Station.

This species is not so acrid as some of the others, so it was generally employed in medicine only when the more powerful species could not be obtained, but it was used for the same purposes as *R. bulbosus* and *R. sceleratus*.

In areas where this species has become an obnoxious weed, infested fields should be plowed and followed by a clean cultivated crop for one or two years. Muenscher (1952) also suggests that isolated patches appearing in meadows or pastures can be eradicated by spraying with a weed killer so as to avoid the danger of dragging the runners to clean parts of the field with a drag or harrow.

Ranúnculus trichophýllus Chaix. White Water-crowfoot.

Meaning of Species Name. With hairlike leaves.
Synonyms. R. aquatilis L. in Gleason (1952).
Other Names. White Water-buttercup.
Type of Plant. A perennial aquatic herb.
Habitat. Fresh to brackish waters of ponds, quiet waters, and slowly flowing streams.
Range. Nf and Lab to Ak, s to NC, NM, Ariz, and Lower Cal; also in Eurasia.
Distr in NYS. Infrequent but widely distr across the state

Distr in the Torrey Range. Throughout the range except in the pine barrens and s of them in NJ.
Time of Fl. May-Jul(Sep); Jun 20-Jul at Cornell.
Origin. Native.
Remarks. A circumboreal species.

Johnson (1867) remarked of this species that it "is an exception to the general character of the genus, being quite harmless, at all events to cattle.... [In Great Britain] it is used by the peasantry as fodder. They collect it in boats and give it to their cows and horses ... Hogs eat it and will live upon it alone until put up to fatten."

Thalíctrum L. Meadow-rue.

There are about 120 species of Thalictrum, hardy herbaceous perennials, some species of which are valued horticulturally both for their graceful, ornamental leaves and for their summer flowers. They are widely distributed over most parts of the world, but most abundant in the northern hemisphere, most of them being natives of various parts of Eurasia as well as of North America. They have 2-3-ternately compound leaves, the divisions and the leaflets stalked, with petioles dilated at base. The flowers are borne in corymbs, panicles, or in racemes, often polygamous or dioecious. The name of the genus is derived from the Greek thaliktron, the name of some plant mentioned by Dioscorides.

Many species are suitable for planting in the herbaceous border; those of low growth are grown in the rock garden. T. aquilegifolium is the finest of all for the herbaceous border, while T. minus is a good rock-garden plant; its beautiful fernlike leaves are useful for cutting for decorative purposes indoors.

The stalks of one species have been used as the source of a "vignona" dye. The Indians of New Mexico are reported to collect the entire plant of T. fendleri when in full bloom for use in the treatment of headaches. The dried plant is rolled into a cigarette for smoking or sprinkled on coals so the fumes can be inhaled. Blackfoot Indians kept the partially ripened fruit of T. dasycarpum for their pleasant smell.

Key to Local Species of Thalictrum

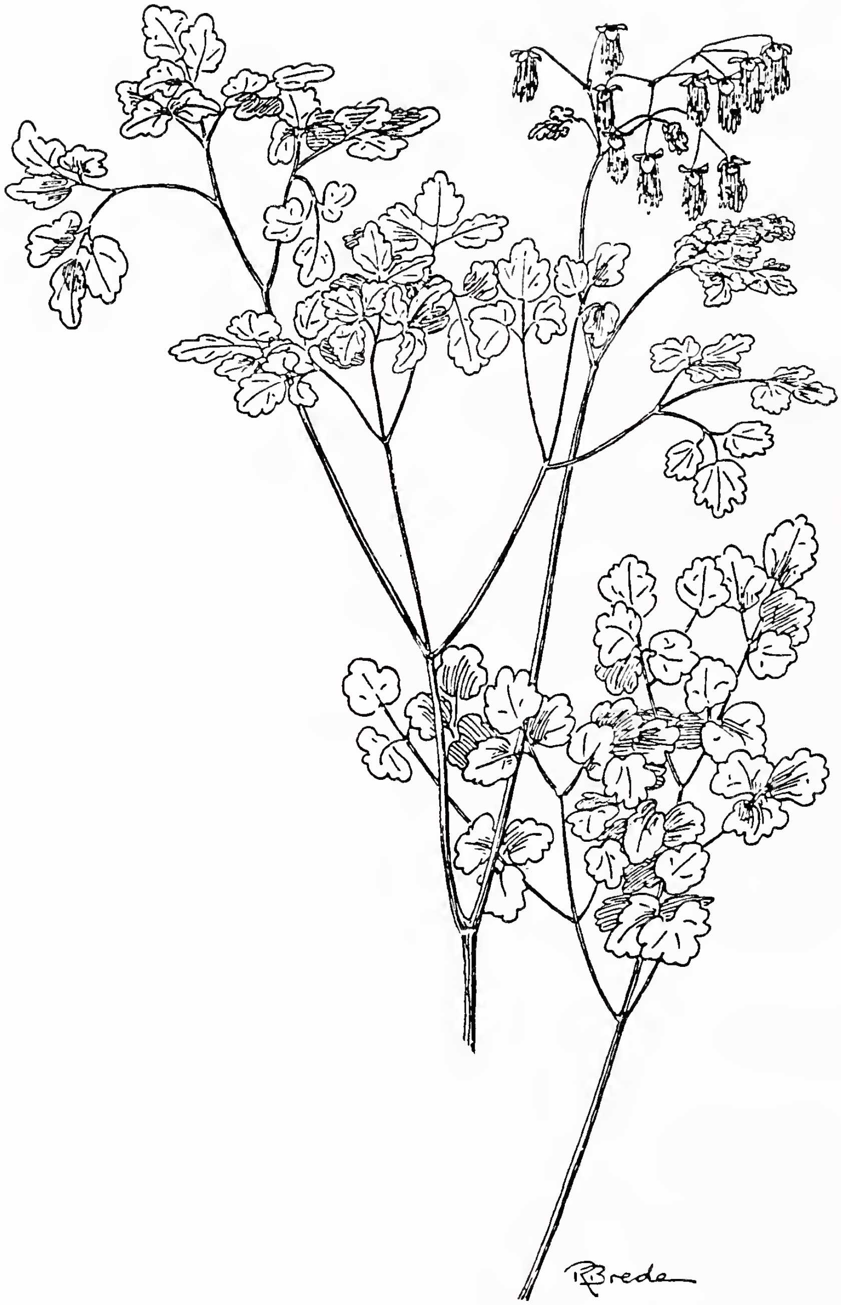
1. Pistillate and fruiting plants, 2
   2. Middle and upper cauline leaves long-petioled, barely expanded at flowering time, their semiovate to lunate stipules green and herbaceous; flowers in spring............ *T. dioicum*
   2. Middle and upper cauline leaves sessile to only short-petioled, well developed at flowering time, their ovate to suborbicular stipules brown and subcoriaceous; flowers in summer.. *T. pubescens*
1. Staminate plants, 3
   3. Filaments delicately filiform, soon drooping and frequently entangling in age; flowers dioecious, developing in early spring.. *T. dioicum*
   3. Filaments dilated upward, ascending, pendulous only in age, rarely entangling; flowers developing in summer.......... *T. pubescens*

Thalíctrum dioìcum L. Early Meadow-rue.

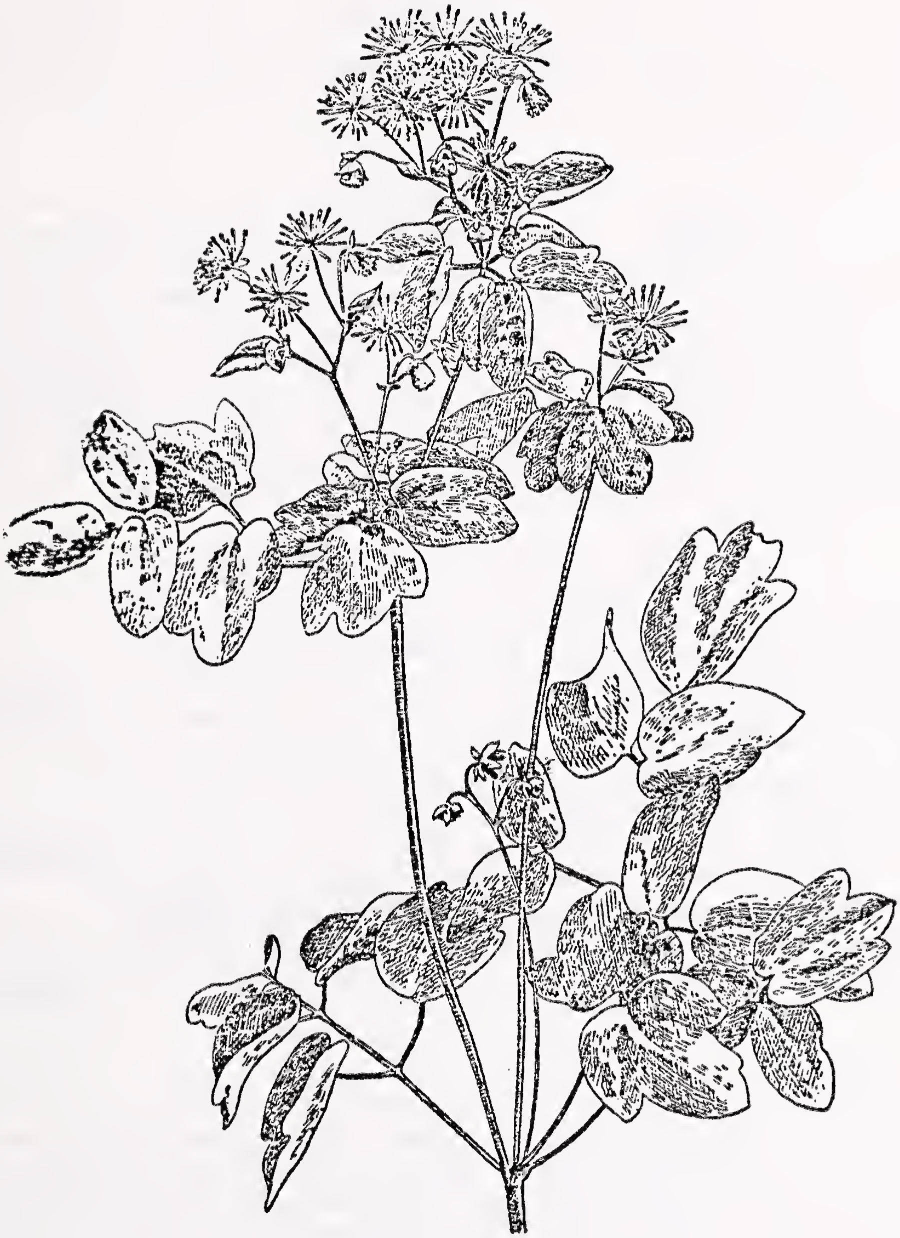
Meaning of Species Name. Dioecious.
Other Names. Quicksilver-weed, Poor-man's Rhubarb, Shining Grass, Feathered Columbine.
Type of Plant. A perennial herb.
Habitat. Rich rocky woods, ravines, alluvial terraces, rocky banks, and moist slopes.
Range. Que to Man, s to SC, Ga, Ky, Ala, and Mo.
Distr in NYS. Common or frequent across the state n of the coastal plain of LI.
Distr in the Torrey Range. Throughout the area except in the pine barrens and the coastal plain of LI, there wanting, and rare in the reg surrounding the NJ pine barrens; always increasing northw.
Elevation. Grows to 4500 ft in NC; collected at 3365 ft in Delaware co.
Origin. Native.
Remarks. Usually flowering with or before expansion of leaves on deciduous trees; foliage makes good ground cover in shaded gardens.

Thalíctrum pubéscens Pursh. Late Meadow-rue.

Meaning of Species Name. Hairy.
Synonyms. *T. polygamum* Muhl. in Fernald (1950) and in Gleason (1952).
Other Names. Tall Meadow-rue, Muskrat-weed, King-of-the-meadow, Silver-weed, Rattlesnake-bite, Celandine, Fall Meadow-rue, Musquash-weed.
Type of Plant. A perennial herb.
Habitat. Wet meadows, low thickets, streambanks, and swamps.
Range. Lab to Ont, s to w NC, Ga, Tenn, and Ind.
Distr in NYS. Common in most secs of the state.
Distr in the Torrey Range. Common throughout the area except in the pine barrens, there wanting.
Elevation. Ascends to 2500 ft in Va.
Time of Fl. Jun-Aug; Jul at Cornell.
Origin. Native.



Thalictrum dioicum--Early Meadow-rue
[From Smith (1966), Plate 53, p. 128.]



Thalictrum pubescens--Late Meadow-rue
[From Dana (1900), Plate 51, p. 121.]

BERBERIDÀCEAE, the Barberry Family

There are about 20 genera and more than 200 species in the Barberry family, plants chiefly of the north temperate zone, although some species of Berberis extend into southern South America. Seven genera are represented in this country, most of which occur in the Pacific states. The Berberidaceae are distinguished from related families in the Ranales in that for most genera of this family (except in Podophyllum) the number of stamens equals the number of petals--a distinctive trait, for almost all other families comprising this order have stamens greatly in excess of the number of petals. Our herbaceous species in this family are interesting survivors of an Arcto-Tertiary flora.

There is general agreement that the genera of this family are not closely related to one another. Chapman pointed out that this family and the Ranunculaceae arose by parallel evolution from a proranalian complex, causing her to doubt that the Berberidaceae could have been the progenitors of the Papaveraceae or of the Rhoeadales. Economically the family is of domestic importance for its large number of ornamental species (about 100 species from 9 genera are offered in the trade). Fruits of Podophyllum are edible (used for preserves and beverages), but the leaves and roots are poisonous. Berberis fruits are likewise edible, and plants of the naturalized B. vulgaris serve as the alternate host of the wheat rust.

Key to Catskill Genera of the Berberidaceae

1. Plants shrubby, usually bearing prickles; flowers and inner bark yellow; leaves either entire or finely toothed; fruit a red, few-seeded berry.. Berberis
1. Plants herbaceous; flowers waxy-white or yellowish-green; leaves deeply lobed or divided into many leaflets; mature fruit deep blue or yellowish-green (rarely reddish), 2
    2. Flowers racemose, yellowish-green, small; leaf 1, divided into many leaflets; mature fruit deep blue............... Caulophyllum
    2. Flowers solitary, rather large, nodding, white (rarely pinkish); leaves of the flowering stems 2, deeply lobed, 1-sided, peltate; fruit a large fleshy berry, yellowish (rarely reddish) when ripe.............................. Podophyllum

Bérberis L. Barberry.

There are about 175 species of barberries, hardy and tender evergreen and deciduous shrubs widely distributed in both the old and new worlds, but particularly abundant in China. Both species growing in the Catskills are introduced, but several native species grow in the western states. These shrubs have yellow wood, yellow inner bark, and yellowish flowers with sensitive stamens that spring forward when the base is touched. Another characteristic of all barberries is that spines are found at the base of each growth bud. A number of species are cultivated for ornament, some by reason of their beautiful and fragrant flowers; others are more attractive when displaying their brightly colored fruits later in the year. The name of the genus is derived from berberys, the Arabic name of the fruit. Several species make very good informal hedges, particularly those that retain their leaves through the winter, but only one of the evergreen species, B. julianae from China, is hardy in the latitude of New York City.

The fruits of a number of Asiatic species are much relished as food. In Nepal the fruits of B. aristata are dried in the sun like raisins by the Hill People and sent down to the plains of India for sale, as also are the fruits of B. nepalensis. In China the fruits of B. lycium are "preserved as in Europe, and the young shoots and leaves are made use of as a vegetable or for infusion as a tea." In western North America the Oregon Grape, B. aquifolium (now known as Mahonia aquifolia) bears deep blue berries in clusters somewhat like the Frost Grape, which "are used as food, and the juice when fermented makes, on the addition of sugar, a palatable and wholesome wine." In 1881 its fruit was "highly prized for its medicinal properties," being much used by the Mormons of Utah. B. buxifolia, the Magellan Barberry, a native of Chile and Argentina, was considered the best of the South American species; in 1831 its fruit was used in England "both green and ripe as are gooseberries, for making pies and tarts." B. pinnata, the Blue Barberry of Mexico, also bears fruit "very pleasant to the taste, being saccharine with a slight acidity." The U.S. Dispensatory of 1865 reported that "The Lycium of the ancients, highly valued as a local application in affections of the eye and eyelids, is supposed to be the medicine still used in India for the same affections; it is an extract from the wood or roots of different species of Berberis, as B. lycium and B. aristata."

The Oregon Grape was a favorite medicinal plant of the California Indians, who made a decoction of the roots in water or steeped them in liquor; this medicine was taken internally for general debility or to create an appetite. This may be the species mentioned by Franz Boas in 1932 as being used by the Kwakiutl Indians, who prepared a decoction from the dried bark for use in biliousness. This species was long used in western medicine as a tonic and blood purifier. Introduced to American medicine in 1877, it was official in the U.S. Pharmacopeia, 1905-16, and in the National Formulary, 1916-47, the dried rhizome and roots being used as a bitter tonic. An eastern "Barberry-Tree or Bush" was described in 1737 by John Brickell in his Natural History of North Carolina. "The Bark and Leaves," he wrote, "open Obstructions, and are of singular use in Jaundice. The Fruit is very cooling in Fevers, grateful to the Stomach, and causeth a good Appetite." This was undoubtedly the American Barberry, B. canadensis, a species native to the southeastern states, which was official in the U.S. Pharmacopeia, New York Edition, 1831-42, for use in an acidulous drink prescribed as a febrifuge. Rafinesque (1828-30) called this species antiseptic, acid, subastringent, and refrigerant, and stated that "The berries, leaves, bark and roots, may be used in putrid fevers, dysentery, bilious diarrhea, summer flux, and all kinds of acute inflammations. A syrup, jelly, conserve, &c. are made with them, which prove very palatable, cooling, and beneficial in those complaints, as auxiliary remedies. It has also been used in the jaundice and other diseases; but with less success and certainty." Berberine, an alkaloid, is abundant in the root bark. It now has little use in medicine, although Berberis extracts are used to some extent as bitter tonics. Their alleged value in the treatment of malaria and other fevers has long since been discredited, but in 1934 one authority reported excellent results in the treatment of "Oriental sore" by local injection.

Some species of barberry were also useful as dye plants. In Greece the Cretan Barberry, *B. cretica*, the only species native to that area, provided a yellow dye for both wool and silk; all parts of the plant, including the root, were used. The leaves of *B. vulgaris* were used in Yugoslavia to obtain a black dye. In Norway a soft reddish-yellow color was obtained from small twigs bearing young leaves, cut and used either fresh or dried.

Barberries are of most value to wildlife in the west, according to Martin *et al.* (1961), where hoofed browsers, especially deer, eat the plants freely. The fleshy fruits seem to be utilized by birds only to a limited degree.

Key to Local Species of Berberis

1. Prickles simple; leaves entire; flowers solitary or in small clusters; berries dryish................................ *B. thunbergii*

1. Prickles (or many of them) forking; leaves serrulate or denticulate, the teeth ending in a bristle; flowers in racemes; berries juicy... *B. vulgaris*

Bérberis thúnbergii DC. Japanese Barberry.

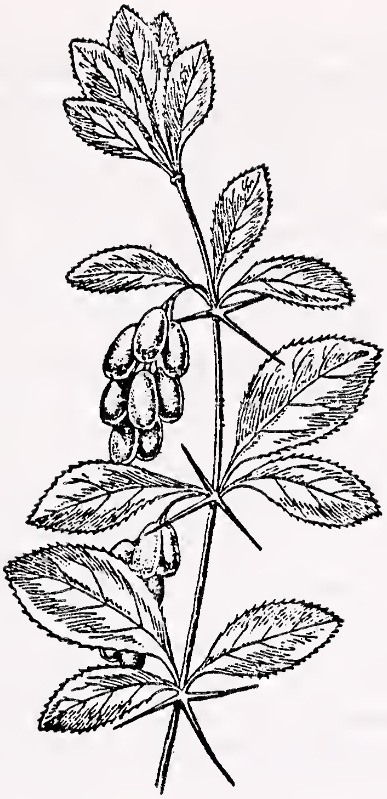
Meaning of Species Name. Named for Carl Peter Thunberg, 1743-1828.
Type of Plant. A compact shrub often attaining a height of 6 ft.
Habitat. Roadsides, thickets, pastures, and other open habitats.
Range. Esc from NS to Mich, s to NC and Mo.
Distr in NYS. Not listed in House (1924).
Distr in the Torrey Range. Not listed in Taylor (1915).
Time of Fl. Apr-May.
Origin. Introd from Asia.

This hardy species is particularly beautiful because of the rich scarlet and orange coloring of the leaves in autumn, so it has been much planted in our area for low hedges. The variety *atropurpurea* has purple foliage. It is the only barberry of the eastern states that does not transmit stem rust to cereal plants. Since neither Taylor nor House mentioned this plant as being part of our flora, it would seem to be a comparatively recent introduction, the seeds no doubt having been spread by birds.

The bright-colored fruits of this common hedge plant are available to birds throughout the winter, but they do not seem to be much relished; birds make use of them only in critical periods when other foods are scarce. They are then eaten by many species of birds, however, including ruffed grouse, bobwhite, and pheasant.

Bérberis vulgàris L. European Barberry.

Meaning of Species Name, Common.
Other Names. Common Barberry, Pepperidge-bush, Jaundice-tree, Jaundice-berry, Wood-sour.
Type of Plant. An upright shrub some 6 ft high, reproducing by seeds and new shoots from spreading roots.



Berberis vulgaris--European Barberry
[From Medsger (1939), p. 12.]

Habitat. Thickets, pastures, roadsides, fencerows, open woods, and rocky woodlands.
Range. NS to Minn, s to Del, Pa, Ia, and Mo.
Distr in NYS. Common, especially in the Hudson valley.
Distr in the Torrey Range. A rare esc in our area.
Time of Fl. May-Jun; May 20-Jun 15 at Cornell.
Origin. Natzd from Eu.
Remarks. Formerly widely planted and frequently esc in NE and NY; still in current demand by manufacturers of pharmaceutical products.

The stamens of barberry flowers show remarkable sensitivity when touched. In their original position, they lie in a concavity of the petals, sheltered from rain, and there remain until some insect unavoidably touches them. Linnaeus observed that when bees in search of honey touch the filaments, they spring from the petal and strike the anther against the stigma, thereby exploding the pollen. Insects of various kinds are attracted to barberry flowers; since these insects fly chiefly during sunny weather, which promotes the dispersal of pollen, this curious contrivance ensures fertilization of the seeds at the most suitable time.

The European Barberry has long been cultivated for its fruit; in regions where it abounds it has always been a favorite fruit for spiced preserves, jellies, and jams. The leaves, like the fruit, are also acid and make a palatable nibble. They have sometimes been used for the same purposes as the fruit. Gerard recommended the leaves "to season meat with and instead of a salad." The berries were also sometimes "boiled in soups to give them a tart flavor." In making jelly, the juice should, if possible, be extracted without the addition of water; when water is used, it is necessary to add apples or pectin to make the juice jell. Barberry juice, mixed with an equal bulk of sugar, makes a very tart, distinctly flavored jelly. The juice is especially desirable for mixing with other sweet or insipid fruit in preserves or jellies to improve their flavor. In 1815 Thomas Cooper mentioned that barberry root was imported to Pennsylvania from Boston, and that its fruit made "an excellent tart, and a beautiful pickle." It was sometimes planted in gardens in England for its fruit and was early introduced into New England, where it increased so rapidly that in 1754 the Province of Massachusetts passed an act to prevent its spreading.

The berries, rich in vitamin C, were preserved in sugar, in syrup, or candied for use as a confection. They were also occasionally pickled in vinegar or used for flavoring. A sauce of the bruised leaves, prepared in a manner similar to that for making sorrel sauce, was formerly used in England to serve with meat. New England housewives often added barberries to cans of other preserved fruits, to which they lent a tart flavor. The berries have also been used like cranberries to make a sauce of fine flavor, as well as in tarts and pies; they can likewise be cooked in a spiced syrup. One drawback of these dishes, however, is that they are full of "shoe pegs" from the many seeds. Syrup made from barberries, mixed with water, sugar, and other juices, makes a pleasant cooling drink, but it ferments quickly.

In medicine the European Barberry was long used as a tonic, purgative, and antiseptic. After being dried, both stem and root bark were used in the form of a liquid extract given as a decoction, infusion, or tincture, but in more modern practice a salt of the alkaloid berberine is generally preferred. Employed as a bitter stomachic tonic, it was prescribed for dyspepsia, functional derangement of the liver, and to regulate the digestive powers; given in larger doses, it acted as a mild purgative, relieving constipation. It was used in the treatment of jaundice, general debility, biliousness, and for diarrhea. It was once erroneously thought to possess febrifuge powers and was therefore prescribed for intermittent fevers. This practice survived well into the last century, for Johnson (1867) reported that "In Egypt a drink, prepared by macerating the crushed berries in about twelve times their quantity of water, with the addition of a little fennel seed, is largely used as a cooling draught in fevers, especially those of a malignant character, this fruit having strong antiseptic qualities." The berries have a sour, astringent taste and contain malic and citric acids. They are refrigerant, astringent, and antiscorbutic; during the 1800's they were used in Europe, in the form of a drink, in febrile diseases and diarrhea. In the form of a jelly made from the fruit, it was found very refreshing in irritable sore throat, and a syrup of the berries made with water was considered an excellent astringent gargle.

The bark of the root was the official portion, however, which was usually used in the form of a decoction as a tonic and as a laxative. It was formerly much used in the treatment of jaundice, according to the U.S. Dispensatory of 1865, "in which, though probably originally employed on account of its yellow color, it may be useful when the influence of a gentle tonic and laxative is required." Its active ingredient is the alkaloid berberine, which "is possessed of valuable remedial powers, and capable of advantageous application in many diseases." Millspaugh (1887) reported that "As a drug it was steeped in beer and given to patients suffering from jaundice, as well as to check hemorrhages; as a food preparation for the sick, the berries were made into a confection, and used as a refrigerant in fevers and burning gastric ailments ..." "Its popular use as a remedy--barberry bark and cider," he continues, "was held in all forms of abdominal inflammation, but especially those accompanied with hepatic derangement and jaundice." The bark of this species, considered similar to B. aquifolium in its properties, was official in the U.S. Pharmacopeia, 1863-82.

Even the Indians made medicinal use of this introduced European plant, for the Penobscots of Maine pounded the roots or bark to a mash to treat ulcerated gums and sore throat, while the Catawbas boiled the stems and roots to make a tea for stomach ulcers. Since this species was used in Europe for similar purposes, one must assume that the Indians learned the medicinal properties of this species from the early colonists.

In addition, this species also served as a dye plant, the roots imparting a beautiful rich, bright yellow to wool, but it was fugitive if used without a mordant. It was used by leather dyers and in textile dyeing, however, when combined with other more permanent coloring agents. The roots, "steeped with strong ash lye," were once used to give hair a yellow color, evidence, perhaps, that a penchant for blond hair is not necessarily a modern vogue. The same preparation was sometimes used to dye wool, and, by using alum in place of the ash-lye, the roots and inner bark of the stems are reported to have furnished a beautiful dye for linen fabrics. In Yugoslavia the leaves of this species were used to obtain a black dye.

Statistics on wildlife use of this plant in the northeastern states indicate that it is used by birds and deer only to a limited extent, possibly because it is no longer generally available; much of the common barberry has been eradicated in the northeastern states because of its role as a host for one phase of the wheat rust; but in some areas of the Catskills, this species seems to be spreading again.

Since the European Barberry (as well as most other species of Berberis) is an alternate host for the black stem rust of wheat, oats, rye, barley, and various other grasses, it should not be grown where such grains are cultivated. This rust has one stage of its life cycle on the cereals and other grasses, while the alternate stage occurs on one of a number of barberries. By eliminating the barberries, the rust cannot infect the grasses. The U.S. Department of Agriculture was at one time almost literally at war with this plant and destroyed many millions of bushes in the northcentral and northeastern states. In other areas where this shrub has become an undesirable weed in pastures and other places, Muenscher (1952) suggests that it can be brought under control by grubbing out scattered bushes, making sure to get all the roots; otherwise, they will send up new shoots. In stony ground where digging is not practicable, it may be necessary to use a chemical weed-killer, but care should be taken to choose one that will not contaminate the environment.

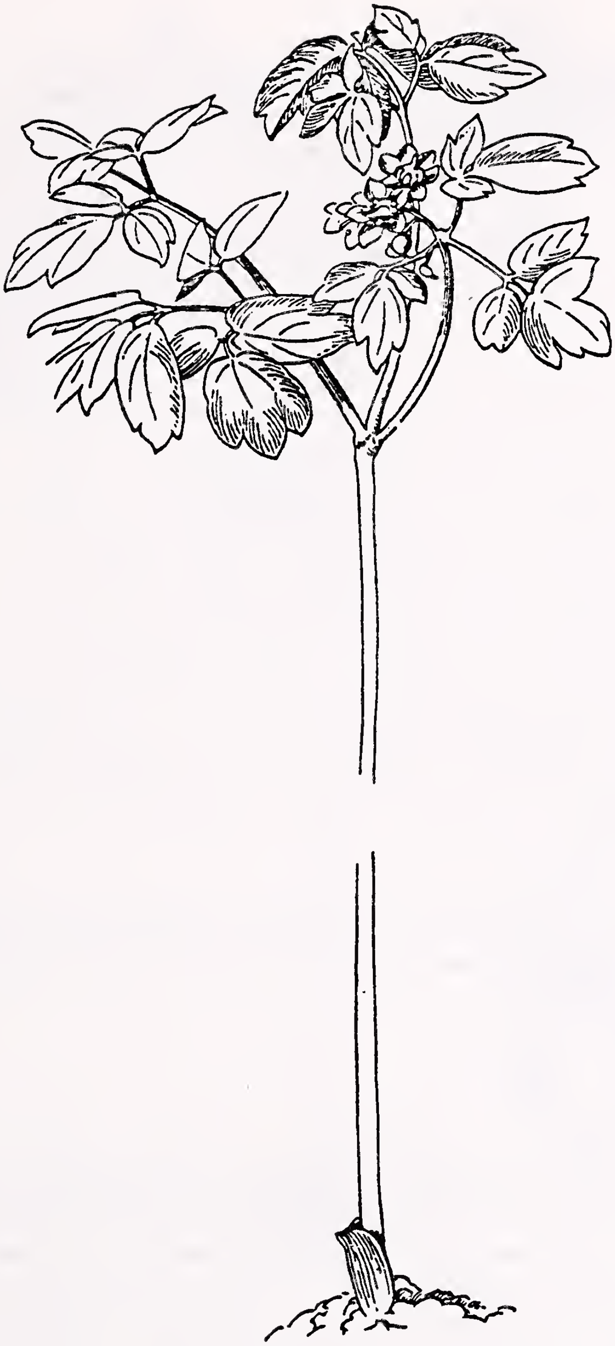
Caulophyllum Michx. Blue Cohosh.

There are two species of Caulophyllum, one in North America and another in eastern Asia. The name of the genus is derived from the Greek kaulos, stem, and phullon, a leaf, the stem seeming to form a stalk for the greatly expanded leaf. They are glabrous perennial herbs with matted knotty rootstocks sending up in early spring a simple and naked stem terminated by a small raceme or panicle of yellowish-green flowers, below which the stem bears a large triternately compound sessile leaf. The unusual ultramarine-blue "fruits" are actually naked seeds surrounded by a fleshy coat (aril). They generally mature in summer and are considered poisonous; children especially should be cautioned against eating them.

Caulophyllum thalictroides (L.) Michx. Blue Cohosh.

Meaning of Species Name. Resembling Thalictrum, Meadow-rue.
Other Names. Papoose-root, Blueberry, Blue-ginseng, Blueberry-root, Squawroot.
Type of Plant. A perennial herb, reproducing by seeds.
Habitat. Rich woods and thickets.
Range. NB to Ont and Man, s to mts of SC, Tenn, Ala, and Mo; also in e Asia.
Distr in NYS. Common in most secs of the state.
Distr in the Torrey Range. NY: Unknown on LI, rare and local in the Bronx and Westchester co, thence increasing and common northw.
Elevation. Grows to 5000 ft in NC; sea level-3365 ft in the Torrey range.
Time of Fl. Late Apr-early Jun; Apr-May at Cornell.
Origin. Native.
Remarks. Still in current demand as a drug plant.

Cohosh is an Algonquin name that was applied not only to this species but also to Cimicifuga racemosa and Actaea alba, but the designation Blue Cohosh referred only to this plant, which the Omaha Indians considered a most effective remedy for fever when administered as a decoction of the root. It was much more renowned, and widely used by many Indian tribes, however, as a valuable parturiant and as a favored remedy in the treatment of "female troubles," hence its common names of Squawroot and Papoose-root. Rafinesque (1828-30) called this species demulcent, antispasmodic, emenagogue, and sudorific, stating that "It is used by the Indians and their imitators for rheumatism, dropsy, colic, sore throat, cramp, hiccup, epilepsy, hysterics, inflammation of uterus, &c. It appears to be particularly suitable for female diseases, and Smith asserts that the Indian women owe the facility of their parturition, to a constant use of a tea of the root for two or three weeks before their time. As a powerful emmenagogue it promotes delivery, menstruation, and dropsical discharges." Densmore (1928) also states that the Chippewas used this plant in the treatment of a number of disorders. A decoction of two roots boiled in 1 quart of water was taken internally, a swallow at a time, for lung trouble. Rudbeckia laciniata and Caulophyllum roots were combined in equal parts and steeped for internal use in the treatment of indigestion. This liquid was also used in treating horses. A decoction made from equal parts of the roots of this plant and Sanguinaria



Caulophyllum thalictroides--Blue Cohosh
[From Smith (1966), Plate 62, p. 144.]

canadensis was also taken internally in the treatment of cramps, while a quick-acting emetic was prepared by making a decoction of one root.

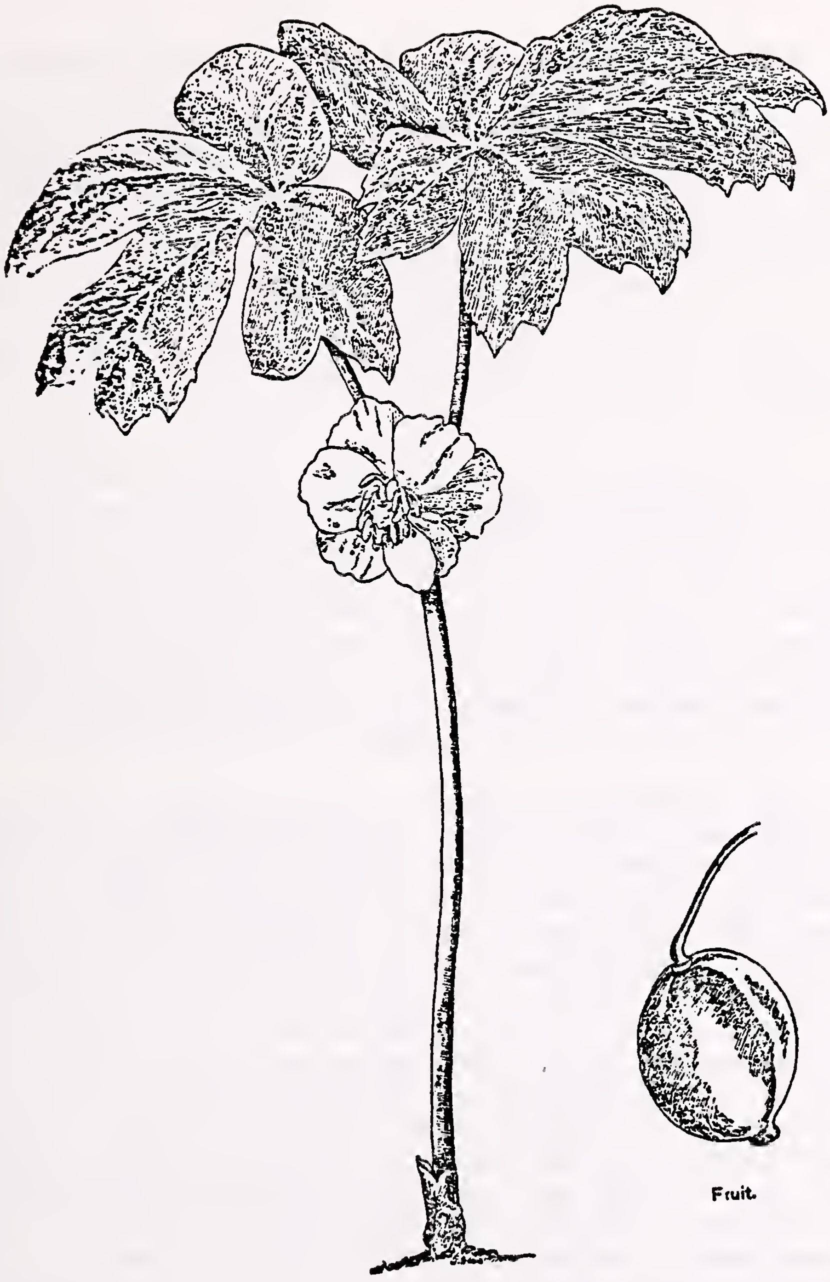
A medicinal plant so widely used by the Indians could not help but attract the attention of the early settlers and it soon became a popular home remedy, but it took some time for the medical profession to ascertain its properties. In 1801 Samuel Stearns, a "botanist-physician," stated that it had been used in menstrual obstructions and to strengthen the stomach, although its medical properties had not yet been fully ascertained. Nearly three decades later Rafinesque wrote that "This is a medical plant of the Indians, and although not yet introduced into our official books, deserves to be better known."

In 1849 Dr. Stephen Williams reported to the American Medical Association that the root was demulcent, antispasmodic, sudorific, and emmenagogue, stating that it "partakes of the nature of ginseng and seneka" and that it "promotes delivery, the menstrual flux and dropsical discharges." This and later investigations led to its admission to the U.S. Pharmacopeia in 1882, where it remained until 1905; it was later listed in the National Formulary, 1916-50, for use as an antispasmodic, emmenagogue, and diuretic. Around 1909 the root of this plant brought from 2 1/2 to 4¢ a pound, and it is still in demand by manufacturers of pharmaceutical products. Millspaugh (1887) stated that the uses made of this plant by the Indians "have been proven reliable by all methods of practice since" and gave directions for preparing a tincture of the root: "The fresh root, gathered in early spring, is chopped and pounded to a pulp and weighed. Then two parts by weight of alcohol are taken, the pulp mixed thoroughly with one-sixth part of it, and the rest of the alcohol added. After stirring the whole well, and pouring it into a well-stoppered bottle, allow it to stand at least eight days in a dark, cool place." The tincture is obtained from the above mass by filtration. The decoction, prepared in the proportions of an ounce to a pint of water, appears to have been made from the dried and powdered roots collected in the fall.

Blue Cohosh is poisonous to livestock but, since it is extremely bitter, farm animals usually avoid it. Children should not be permitted to eat the fruit, however, and some people have developed dermatitis from handling the plant.

Podophyllum L. May-apple

There are four species of Podophyllum, the other three occurring in eastern Asia. The name of the genus is derived from the Greek pous, foot, and phullon, leaf, probably referring to the stout petioles of the radical leaf. Some authorities, however, feel that the name of the genus alludes to a fanciful resemblance of the palmate leaf to the foot of some web-footed bird, hence one of the popular names of the plant--Duck's-foot. They are hardy perennial herbs with creeping rhizomes and thick fibrous roots. The stems are usually two-leaved and one-flowered. These plants are sometimes cultivated for ornament, but they require a moist semishaded position and are therefore usually grown in woodlands, in shaded borders, or in rock gardens. Planting is done in April, when the crowns are set just below the surface. They should not be disturbed for several years, as they flower best when firmly established.



Podophyllum peltatum--May-apple
[From Dana (1900), Plate 6, p. 15.]

Podophýllum peltàtum L. May-apple.

Meaning of Species Name. Shield-shaped, alluding to the shape of the leaf.

Other Names. Mandrake, Wild Jalap, Indian-apple, Hog-apple, Devil's-apples, Wild-lemon, Ground-lemon, Puck's-foot, Racoon-berry, Wild Mandrake, American Mandrake, Duck's-foot.

Type of Plant. A perennial herb, reproducing by seeds.

Habitat. Rich open woods, thickets, roadsides, and pastures.

Range. Que to Ont and Minn, s to Fla and Tex; spread from cult elsewhere.

Distr in NYS. Frequent or common throughout most parts of the state but not reported from LI, rare on SI, rare or local in most secs of the Adirondacks, and not reported from the extreme n part of the state.

Distr in the Torrey Range. NY: Unknown on LI, rare and local on SI, and in the Bronx, increasing and common northw.

Elevation. Grows to 2500 ft in Va; sea level-2500 ft in the Torrey range.

Time of Fl. Early Apr-early Jun, fr Aug; fl May 20-Jun 10 at Cornell.

Origin. Native.

Remarks. Still in current demand as a drug plant.

In many areas this plant is called Mandrake instead of May-apple. The original Mandrake was Mandragora officinarum, a native of the Mediterranean region, one of the most revered of all the ancient medicinal herbs and one that during the medieval period became surrounded with an unbelievable amount of superstition and folklore. At that time the roots, trimmed to resemble small human figures, were sold all over Europe, where they were much used in medicine and magic. When early settlers in America learned the properties of this plant from the Indians, they transferred the name and much of the lore of the Mandrake to this unrelated American plant.

Although Asa Gray described the fruit of the May-apple (so called because it flowers in May) as "mawkish, eaten by pigs and boys," in its fresh state it has a peculiar, rather lemony flavor with a taste somewhat resembling that of the Paw-paw, quite agreeable to many adults; on the other hand, some persons consider the odor of the flower to be quite unpleasant. The edible fruit is yellowish in color when ripe and rather pulpy, having a slightly sweet but mildly acid quality. During the 1800's it was often available in the public markets. The fruit can be eaten raw, but it was most often used in the preparation of jelly, marmalade, or preserves, which are somewhat reminiscent of the tropical guava jelly or paste. In the south a drink is prepared from the juice with Madeira wine and sugar; a less ardent beverage can be made by squeezing the juice into lemonade, other fruit drinks, or mixed with sugar. The foliage and stems, when appearing in spring, have also been used as a potherb, a practice decidedly not recommended, as in some cases the results were fatal. While the fully ripe fruit is edible, the rest of the plant, including the green fruit, must be considered poisonous.

While the raw ripe fruit does not appeal to all palates, it makes a superior marmalade. Gibbons (1962) made a marmalade from the fruits of this plant by first removing the stem and blossom ends from 2 quarts of ripe fruit, cut the "apples" in quarters, and put them in a kettle of suitable size. He then added 1 cup of water and simmered them for about 15 minutes, stirring occasionally to prevent sticking. When the fruit was soft enough, he put it through a colander to remove the seeds. To 4 cups of the strained pulp he added 1 box of Sure-Jell, brought it to a boil, then added 5 cups of sugar. While stirring constantly, he let the mixture come to a hard boil and maintained that boil for 1 minute, after which he skimmed off the foam and poured the rest immediately into half-pint jars and sealed them with paraffin.

In addition to using the fruit as an article of food, the Indians valued the May-apple as a medicinal plant, which they prescribed for a variety of ailments. In 1810 Benjamin Barton reported that "The Podophyllum peltatum is a plant much esteemed by the Cheerake [sic.], and other tribes of North-American Indians. Its root is used as a purgative, emetic, and anthelmintic." He later remarked that the root was "deleterious to worms" and stated that the European settlers had learned its medicinal properties from the Indians. In 1823 John D. Hunter reported that Indian tribes west of the Mississippi not only used the May-apple as a cathartic but also as an antidote for poison (presumably employing it as an emetic) and at the commencement of fevers. Rafinesque (1828-30) stated that "The Cherokees use it against worms, which are expelled by its drastic effects." That tribe also employed "the fresh juice of the root for the cure of deafness, by putting a few drops in the ear." Millspaugh (1887), however, was of the opinion that "Their use of the drug as an anthelmintic seems to be successful only as far as purging is concerned; specifically, it has no anthelmintic power." Although the Indians valued this plant chiefly as an active cathartic, one Indian tribe reportedly applied the crushed roots to warts, while the Meskwakis recognized the root as a physic, emetic, and as a remedy for use in the treatment of rheumatism. May-apples had other uses as well, for the Menominee Indians boiled the whole plant for use as an insecticide on potato plants, and it is reported that some tribes occasionally used the root of this plant to commit suicide.

Since the strong physiological activity of this plant recommended itself to the early settlers, preparations of the root were much employed in folk medicine and continued in use for many years; the use of May-apple root as a component of cathartic pills was very general in the 1800's, for which the fresh root was collected in spring or fall. It was likewise given in infusion, decoction, tincture, or substance; its greatest power was considered to lie in its action on the liver and bowels. Lighthall (n.d.) remarked that "It is a fine remedy when properly given, for ... liver complaint. It arouses the general secretions, and when given in large doses it is a powerful emetic as well as cathartic ..." It was therefore much prescribed for all hepatic complaints with beneficial results that could hardly be exaggerated, but in large doses it produced nausea, vomiting, and inflammation of the stomach and intestines, which sometimes proved fatal. In moderate doses it acted as a drastic purgative and was thought highly valuable in the treatment of dropsy, biliousness, dyspepsia, liver, and other disorders, its most beneficial action being obtained by the use of small doses frequently administered. It was an official drug in the U.S. Pharmacopeia, 1820-1942, and again, 1955-60. In Appalachia a tea made from the roots is still often used in the treatment of constipation. In 1942 it was discovered that podophyllin was beneficial in the treatment of condyloma, a kind of venereal wart; the possibility of its value in treating carcinomas has therefore led to continuing research interest on this drug, but no positive results have yet appeared from such studies.

Cattle, hogs, and sheep have occasionally been poisoned by eating May-apple, particularly in spring, but farm animals will not normally touch it, so cases of poisoning are rare. Poisoning of humans is known primarily as the result of misuse of medicinal preparations made from it. The raw fruit is often eaten by children, occasionally with cathartic results, and some persons handling the powdered roots often experience a severe dermatitis.

RHOEADÀLES

Norris considered the Resedaceae and the Capparidaceae the most primitive families of this order and noted that the Cruciferae, Fumariaceae, and the Papaveraceae were "derived by subsequent parallel evolution from a common ancestral group somewhat resembling the existing Resedaceae and Capparidaceae." Cronquist (1968), on the other hand, abandons the order Rhoedales and places the Capparidaceae, Crudiferae, Moringaceae, Resedaceae, and Tovariaceae in the order Capparales in his subclass Dilleniidae, leaving only two families in his order Papaverales--Papaveraceae and Fumariaceae, which between them contain about 600 species. He derives the Papaverales from the Ranunculales, considering the former as a short evolutionary side branch that has "not given rise to other large groups."

Key to Families of the Catskill Rhoedales

1. Sepals 2 or 3, 2
   2. Stamens numerous; juice milky or colored; flowers radially symmetrical.. Papaveraceae
   2. Stamens 6; juice watery; flowers bilateral............. Fumariaceae
1. Sepals 4 or more, 3
   3. Ovary and capsule 2-celled; stamens 6 (rarely 2), with 4 longer than the other 2................................. Cruciferae
   3. Ovary and capsule 1-celled; stamens 3-many, often unequal but not tetradynamous (with 4 longer than the other 2) Capparidaceae

PAPAVERÀCEAE, the Poppy Family

The members of this family are herbaceous annuals or perennials, rarely shrubs and more rarely trees, with usually milky or colored sap. The estipulate alternate leaves range from entire to pinnately or palmately cleft, with flowers mostly solitary, bisexual, and showy. This is a family of some 28 genera and about 250 species, mostly of the subtropic and temperate regions of the northern hemisphere, with centers of distribution in western North America and eastern Asia. Papaver is a genus primarily of the Mediterranean region, although it is represented by a few species in Asia and America. This family is of economic importance for the opium of commerce, obtained from the sap of unripe capsules of Papaver somniferum. The seeds, which lack the alkaloid morphine, are sometimes ground and used as flour. Of secondary importance for their ornamental value are scores of species from about 20 genera, including the Oriental Poppy, Iceland Poppy, Bush Poppy, and the California Poppy.

Key to Catskill Genera of the Papaveraceae

1. Acaulescent, from a stout rhizome with orange-red juice; leaves basal, rounded, palmately lobed or undulate; scape naked; petals white, 6-12 (usually 8), not crumpled in bud................ Sanguinaria
1. Caulescent; juice yellow or white; leaves pinnately veined or pinnately divided or lobed; petals yellow or scarlet (usually 4, rarely 6), crumpled in bud, 2
   2. Capsule cylindric, 2-4-valved, the ripe valves separating to the base; petals 4, yellow; juice yellow (plant rather hairy) Chelidonium

2. Capsule ovoid or subglobose, 4-20-valved, dehiscent only at summit or to the middle by many pores under the many-rayed, discoid stigma; petals bright scarlet; juice white............ *Papaver*

Chelidònium L. Celandine.

This is a monotypic genus. The name of the genus is derived from the Greek *chelidon*, a swallow, the plant being associated with that bird in ancient folklore. According to Aristotle and other early writers, with its saffron juice the mother swallows bathed the eyes and strengthened the sight of their young. This species is a biennial herb, native of Eurasia, with brittle stems, saffron-colored acrid juice, pinnately divided or twice-pinnatifid and toothed or cut leaves, and small yellow flowers in a pedunculate umbel. Sturtevant (1919) reports that the leaves of "*C. sinense*" were eaten as a food in China during the 14th century; since this is a monotypic genus, his remark presumably applies to this species.

Chelidònium màjus L. Celandine.

Meaning of Species Name. Larger.

Other Names. Swallow-wort, Greater Celandine, Wart-weed, Teterwort, Killwort, Wartwort.

Type of Plant. An erect biennial herb, reproducing by seeds.

Habitat. Commonly established in rich damp soil about towns, in fields, woods, neglected yards, roadsides, and waste places.

Range. Que and Ont to Ia, s to Ga, Tenn, and Mo.

Distr in NYS. Rather frequent throughout the state outside the higher mountain secs, especially in and near towns and cities.

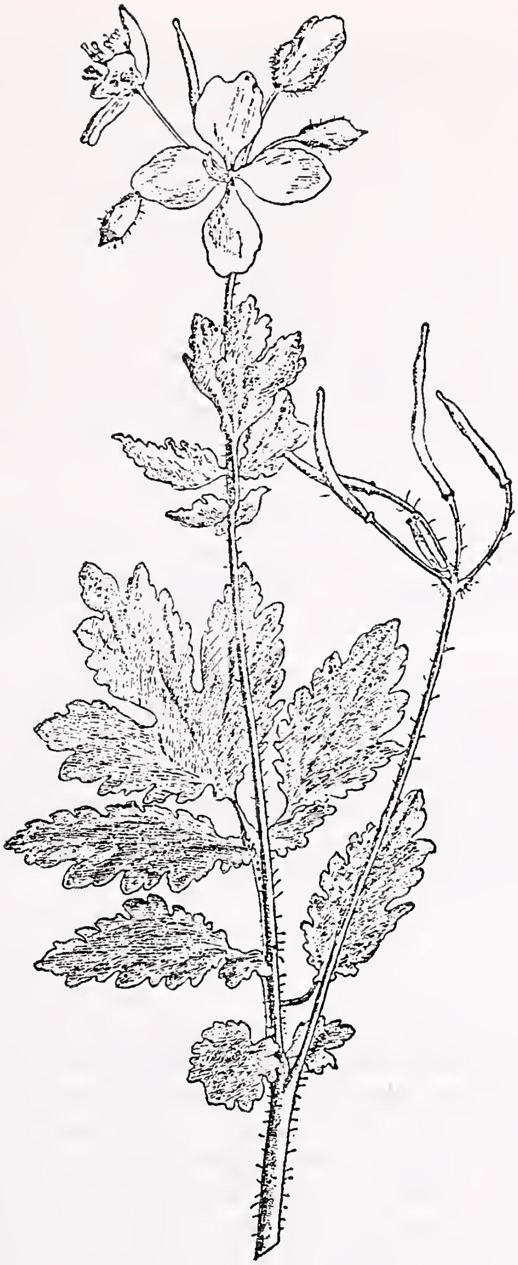
Distr in the Torrey Range. Common in most parts of the range except the pine barrens.

Time of Fl. (Mar)Apr-Aug(Sep); May 20-Jun 20 at Cornell.

Origin. Natzd from Eu.

This plant is the true Celandine, having nothing in common with the Lesser Celandine (*Ranunculus ficaria*) except the color of its flowers. It has been used in medicine since ancient times, its yellow, bitter, acrid juice leading those who practiced the doctrine of signatures to employ it in hepatic disorders because of its resemblance to bile in color. In milk, its acrid juice was employed as an eye lotion to remove white opaque spots on the cornea, a property which Pliny tells us was discovered by swallows, this being a double reason why the plant should be named after these birds. For some medical preparations the whole herb, collected from May to July when in flower, was dried; for other uses, a tincture of the fresh plant gathered in spring was prepared.

Celandine was considered an acrid purgative, possessed also of diuretic and perhaps diaphoretic and expectorant properties, prescribed in the treatment of scrofulous complaints and disorders affecting the lymphatic glands, the skin, and the eyes, an infusion of 1 ounce of the dried herb to a pint of boiling water being prescribed in wineglassful doses. This infusion is a cordial that greatly promotes perspiration. The addition of a few aniseeds in making a decoction of the herb in wine was by some thought to



Chelidonium majus--Celandine
[From Dana (1900), Plate 65, p. 155.]

increase its efficacy in removing obstructions of the liver and gall bladder. Eight to 10 drops of the tincture made either from the whole herb or from the fresh juice was given as a dose three times a day in sweetened water to overcome torpid conditions of the liver. It was likewise considered beneficial in the treatment of the worst forms of scurvy. In overdoses, however, it produced unpleasant effects and had a narcotic action upon the nervous system, so it was by some considered poisonous. It was for a time listed as an official drug in the U.S. Pharmacoepia for its sedative and cathartic action. Johnson (1867) was of the opinion that "the virtues of the plant are probably exaggerated," to say nothing of the fact that "its administration in quantity [is] rather dangerous."

In colonial times the orange-colored juice was often applied to corns and warts, "which it destroys by stimulating them beyond their vital powers," but the acrid juice should not be allowed to come into contact with any other part of the skin. Mixed with sulphur, it was said to be useful in eczema and other itching eruptions. An ointment made of the roots and lard boiled together (or of the leaves and flowers) has been used "with advantage" in the treatment of piles. In southern Europe it was much used as a vulnerary, and, locally applied about the pelvis, the fresh herb was also used in the treatment of amenorrhea "with asserted benefit." It is reported to be a very popular medicine in Russia, where it is said to have proved effective in cases of cancer. According to Grieve (1967), it is still used in Suffolk, England, as a fomentation for toothache, but for the most part its use in medicine has long been discontinued in favor of more effective drugs.

Occasional reports of poisoning in humans and in livestock have been mentioned, but as animals rarely eat this plant, such reports are uncommon. In humans, however, skin poisoning has been produced by rough handling of the plants, for the acrid juice produces inflammation and even blistering when applied to the skin.

In England this plant, which thrives in the shade, is often grown as a garden flower, and it may well have been brought to this country originally as an ornamental. It is a plant for naturalizing in shrubberies and in the wild garden, where it will seed itself freely. In areas where this species has become an undesirable weed, however, it can easily be controlled by hand pulling or hoeing, followed by clean cultivation.

Papaver L. Poppy.

There are more than 100 species of Papaver, primarily in the north temperate zone, many species being native to central and southern Europe and temperate Asia. The name of the genus is the Latin name of the Poppy. In the northeastern states and adjacent Canada, poppies are seldom abundant but are widely distributed in scattered localities, apparently introduced by seed or escaped from gardens. They are herbaceous plants with a white juice and nodding flower buds. This genus provides plants of great value in the garden, a collection of different varieties furnishing showy flowers from early summer until autumn. The Oriental Poppy, P. orientale, often seen in the Catskill region, is one of the most striking of all the flowering plants, furnishing a brilliant display in late May and June; quite a wide range of colors is available from white through salmon-pink and golden orange to scarlet and crimson. The Iceland Poppy, P. nudicaule, is another exceptionally fine garden plant for areas where the summers are not too hot and humid. These flowers also come in a wide range of coloring and are ideal for cutting for decorative use indoors. The Alpine Poppy, P. alpinum, grows only about 6 inches high and is an ideal plant for the rock garden. Several species of annual poppies, including P. rhoeas, the Corn Poppy, are also available for horticultural use. When cut flowers of these plants are desired for bouquets indoors, they should be cut as soon as the buds assume an upright position; they will then open perfectly in water indoors and will last much longer than they would have if left on the plant until the buds were almost ready to burst into blossom.

Several other species of poppies have been found useful for one purpose or another. During the 1850's E. K. Kane observed the Arctic Poppy, P. nudicaule, at all the stations visited on his two voyages to the Arctic seas and concluded that it probably extended to the furthest limits of vegetation. Both the leaves and the seeds, "which are very oleaginous," were found "very agreeable to the taste," much used in that area as a remedy for scorbutic affections. The Turks and Armenians, as reported by Tournefort in 1718, did not use the Oriental Poppy, P. orientale, as a source of opium but rather ate the heads as a delicacy when they were green, "though very acrid and of a hot taste." It is the Opium Poppy, P. somniferum, originally a native of the Mediterranean region, however, that is of most renown among plants of this genus from its long use over many centuries as the source of opium, a drug used to relieve pain even by the ancients. It is presently widely cultivated in many areas as a source of opium, from which heroin is made. The Chinese seem to have originated the practice of drinking, chewing, or smoking opium to produce "intoxication," a vicious habit which has since spread to many other countries. But the Opium Poppy has a number of other uses, for it is grown in northern France and southern Germany for its seeds, which contain no trace of opium. It is supposed to have been cultivated by the ancient Greeks, for Homer mentions it as a garden plant. The Persians sprinkle the seeds over their rice, and in India as well as in a number of European countries the seeds have likewise long been used as a food. Galen remarked that the seeds were "good to season bread," and preferred white to the black seeds. In France and other areas the seeds also yield a bland oil used as a substitute for olive oil. In other areas the peasants use the young plants as food.

Kingsbury (1964) reports that all poppies contain a variety of potentially toxic alkaloids, sometimes in heavy concentration, that have been responsible for poisoning livestock in other countries. While poisoning of farm animals is rare because they find poppies distasteful, they should be considered potentially lethal, particularly since as garden clippings they may be made available to livestock. The feeding of residues of Opium Poppy seed after the oil had been extracted also produced death in cattle in Europe during World War II. Addiction and poisoning in humans from opium or its derivatives is likewise not infrequent.

Papaver rhoeas L. Corn Poppy.

Meaning of Species Name. An old Greek name.

Other Names. Field Poppy, Red Poppy, African Rose, Corn Rose, Redweed, Headache, Canker-rose, Cheesebowl, Thunder-flower, Blue-eyes.

Type of Plant. An annual herb, reproducing by seeds.

Habitat. Rubbish heaps, roadsides, and, rarely, in fields and waste places.

Range. NS to ND, s to Va, Mo, and Kan; introd or esc in many localities, but seldom abundant.

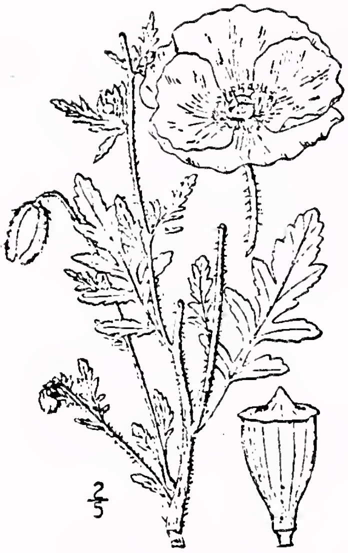
Distr in NYS. Occasional in waste places.

Distr in the Torrey Range. Rare and local as a waif.

Time of Fl. Late May-Oct.

Origin. Adv from Eu.

Remarks. Cult in many horticultural races under the name of Shirley Poppy.



Papaver rhoeas--Corn Poppy
[From Britton & Brown (1913), Vol. II, p. 137.]

Grieve (1967) reports that the petals of this species find a steady, though limited, market in Great Britain, where they are collected in large quantities by organized bands of collectors, including children, who put them in small muslin bags suspended from the neck, so that both hands are left free for gathering. The collecting is done in dry weather, avoiding all possible handling of the fragile petals. The petals, packed with straw in the muslin bags in which they were collected, are sent to market the same day before they can fade or lose their bright color.

Although in Great Britain the Field Poppy is regarded as only a weed, and only a limited quantity of the petals is used, it is cultivated in Flanders and several parts of Germany for the sake of its seeds, which are not only used in cakes, but from which an excellent oil is made, used as a substitute for olive oil. The foliage is said to have been used as a vegetable, and a syrup prepared from the petals has been employed as an ingredient in soups and gruels. Attempts have also been made to utilize the brilliant red of the petals as a dye, but the color has proved too fugitive to be of use. The syrup, however, has been used as a coloring matter for ink.

This species is very slightly narcotic, for its capsules contain the same kind of milky juice as that found in the Opium Poppy, and an extract has been prepared from them having the properties of opium; but, in the words of Johnson (1867), "they are too small, and yield too minute a quantity to be worth cultivating for that purpose." The flowers, on the other hand, "have been long used as a colouring matter in pharmacy, chiefly in the form of a syrup made by boiling the petals with sugar, which is sometimes given to children as a mild opiate; but its narcotic properties are very slight, though it may be useful in the catarrhal affections for which it is usually prescribed." The chief constituent of the fresh petals is the red coloring matter, although all parts of the plant contain the crystalline non-poisonous alkaloid rhoeadine; the amount of active ingredients is very small, however, and rather uncertain in quantity. The fresh petals are principally employed as a coloring agent for mixtures and gargles. The operation of the petals on the system is exceedingly feeble; they are valued more for their beautiful scarlet color, which they communicate to water, than for their medical virtues. The syrup prepared from them was formerly prescribed as an anodyne in catarrhal affections, but it is now little esteemed except for its color.

Where this species has become an undesirable weed, it can be controlled by hand pulling or hoeing.

Sanguinària L. Bloodroot.

This is a monotypic genus, the name of which is derived from the Latin sanguinarius, bleeding, in allusion to the color of the juice. It is a low perennial, its thick prostrate rhizomes (with abundant red-orange acrid juice) sending up in earliest spring a palmate-lobed or undulate leaf and a scape bearing a single, attractive white flower.

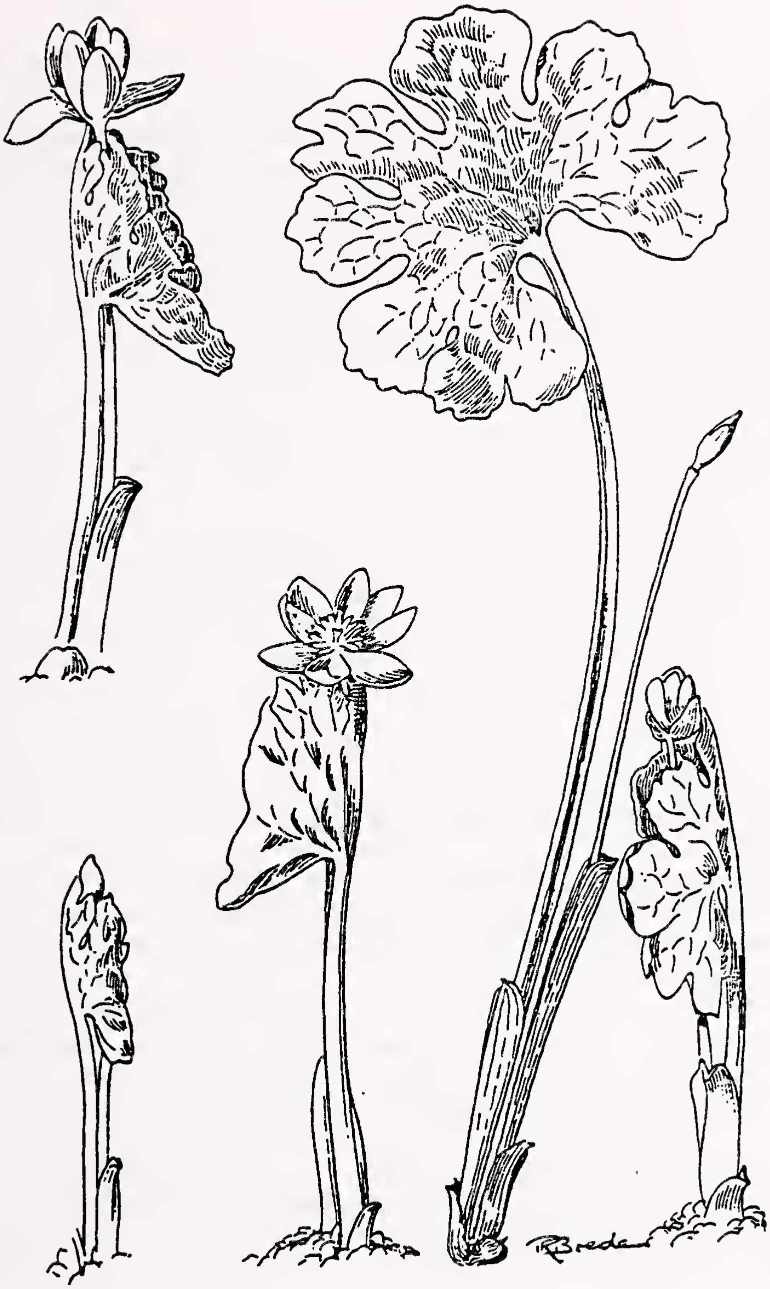
Sanguinària canadénsis L. Bloodroot.

Meaning of Species Name. Canadian.
Other Names. Red Puccoon, Puccoon-root, Tetterwort, Red Indian-paint, Tumeric, Redroot, Corn-root, Pauson, Paucon, Sweet-slumber, White Puccoon, Snakebite, Indian Paint, Coon-root.
Type of Plant. A low perennial herb.
Habitat. Rich woods.
Range. NS to Ont and Man, s to Fla, Ala, Ky, Ill, Kan, and Okla.
Distr in NYS. Frequent or common across the state but absent from most of the Adirondack reg and from the coastal plain and the pine barrens of LI.
Distr in the Torrey Range. Common throughout the area except the pine barrens and the coastal plain of LI, there wanting; always increasing northw.
Elevation. Grows to 2500 ft in Va.
Time of Fl. Mar-May; Apr 15-30 at Cornell.
Origin. Native.
Remarks. Still in current demand as a drug plant.

Bloodroot is a plant of the Poppy family fairly common in the rich woods of eastern North America. The rootstock, together with other parts, contains an acrid, orange-red juice, whence the common name. The first mention of this plant in European literature may well have been Captain John Smith's report of 1612, in which he remarked that "Pocones is a small roote that groweth in the mountains, which being dried and beate in powder turneth red: and this ... [the Indians] use for swellings, aches, annointing their joints, painting their heads and garments." This plant was widely used by various Indian tribes in the treatment of a number of disorders. Vogel (1970) remarks that the Onondagas used Bloodroot as an emetic, while the Rappahannocks prepared a tea for use as a purge in the treatment of fevers and rheumatism. The Mohegans steeped the root for use as a blood medicine and the Menominees added it to other medicines to strengthen their effect. Both the Pillager Ojibwas and the Potawatomis squeezed the juice on a lump of maple sugar and held it in the mouth as a remedy for sore throat. Some tribes also steeped the root to make an infusion used in the treatment of diphtheria, and at least one tribe is reported to have used Bloodroot in the treatment of ringworm. Others chewed the root and placed the spittle on skin burns. Eastern Indians are also reported to have used juice from the roots of this plant as an insect repellent. The Chippewas combined equal parts of the roots of this plant and those of Caulophyllum thalictroides to prepare a decoction taken internally in the treatment of cramps. John D. Hunter reported in 1823 that Indians west of the Mississippi held Bloodroot "in high esteem as a remedy in several of their diseases; but most particularly in rheumatism, for which it is taken in the same manner as the prickly ash."

A medicinal plant so highly regarded by the Indians could not fail to excite the interest of frontiersmen who had to depend much on their own resources in the treatment of the various disorders which beset them. In 1779 J. Carver called Bloodroot "a strong emetic, but a very dangerous one." In 1803 William Downey reported the results of several experiments with this plant in his dissertation for a medical degree at the University of Pennsylvania. He considered it a most effective emetic but suggested that a decoction or extract from the roots was less irritating than a powder or paste made from them. One of the Bartrams had informed him that some southern people used Bloodroot as a preventive of intermittent fever; Downey agreed that "from its general properties, very probably it might be a very useful medicine in this disease." He also felt that it might be effective in the treatment of dysentery, jaundice, ulcerous sore throat, amenorrhea, gonorrhea, and "ulcers of long standing." Rafinesque (1828-30) sums up thoughts current during the first quarter of the 19th century concerning the medicinal values of this species: "The root ... is one of the most valuable medical articles of our country ... It is an acrid narcotic, emetic, deobstruent, diaphoretic, expectorant, vermifuge, escharotic, and at the same time stimulant, tonic.... The Indians used the red juice to paint themselves, and dye or stain skins, baskets, &c. It has not yet been much used in dyeing, although it stains wool of a fine orange color ... A large dose ... is dangerous ... From thirty to eighty drops of the tincture in wine, twice a day, is ... good ... for intermittents, marshy fevers, and inward fevers. It is very bitter, increases the appetite and tone of the stomach. But it is beneficial in many other diseases of the liver and lungs, typhoid pneumonia, whooping [sic] cough, torpor of the liver, ... croup, ... asthma, ... incipient consumption, ulcerous sorethroat, ... dysentery, [and] inflammatory rheumatism, and externally in ulcers, ... fleshy excrescences, and fungous tumors." He concluded that "Few medical plants unite so many useful properties; but it requires to be administered with skilful hands ..."

The effectiveness of this plant in the treatment of a number of these disorders was confirmed by the U.S. Dispensatory of 1865, which stated that "its virtues are highly praised by many judicious practitioners," by whom it was used in the treatment of typhoid pneumonia, catarrh, pertussis, croup, scarlatina, rheumatism, jaundice, dyspepsia, amenorrhea, and other affections either as an emetic, nauseant, alterative, or emmenagogue. "Some physicians speak highly of its efficacy as an excitant to the liver, given in alterative doses. An infusion in vinegar has been employed advantageously, as a local application, in obstinate cutaneous affections, and one doctor found it more efficient as a gargle, in the sore throat of scarlatina, than any other he had employed." The root was also used to clear the throat and nasal passages of mucus, as a tonic, and to induce vomiting. The laity often used Bloodroot



Sanguinaria canadensis--Bloodroot
[From Smith (1966), Plate 63, p. 146.]

as a domestic remedy in gastric troubles, compounded with podophyllum and kali tartaricum. This plant contains several poppy alkaloids, the most important being sanguinarine, "an acrid emetic, with stimulant narcotic powers"; it is similar to that derived from Celandine (Chelidonium majus). "In small doses it excites the stomach and accelerates the circulation; more largely given, it produces nausea and consequent depression of the pulse, and in full doses occasions active vomiting."

Lighthall (n.d.) prepared a tincture from the recently dried root by filling a pint bottle half full of the finely mashed root and adding equal parts of alcohol and water to fill the bottle; of this tincture he prescribed from 1 to 7 drops every 3 or 4 hours. The dried rhizome was official in the U.S. Pharmacopeia, 1820-1926, and in the National Formulary, 1926-65, for use as a stimulating expectorant, emetic, tonic, and alterative; it is one of the Catskill species still in current demand by manufacturers of pharmaceutical products. In spite of its medicinal value, however, this species is on New York State's list of rare and endangered species and may not be disturbed in any way under penalty of the law. Nor is it a drug for casual experimentation, for it is highly toxic and overdoses have proved fatal, death being caused by cardiac paralysis. Bloodroot is also poisonous to farm animals but they seldom eat it because of its acrid taste; in North America it seems not to have caused poisoning of livestock under natural conditions.

Many Indian tribes used the reddish-orange juice of Bloodroot for painting their faces and dyeing articles of clothing and implements of warfare. The early settlers also experimented with this plant as a source of dye and discovered that with an alum mordant it would impart a yellowish-red color to wool. To dye one pound of wool, 8 ounces of the fresh root were cut into small pieces, soaked in water for an hour, then boiled for 30 minutes. The liquid was next strained into a dye bath of 4 to 4 1/2 gallons, which was heated until it was lukewarm. The mordanted, wetted wool was then put into the dye bath, heated slowly, and simmered until the desired color was obtained. The wool was finally rinsed thoroughly and dried in the shade.

Throughout its range Bloodroot is a most attractive spring flower and is often planted for ornament. It is suitable for the front of a partially shaded border, for carpeting beneath deciduous trees, for rock gardens, and for woodland gardens, where it will grow in ordinary soil. The roots should not be disturbed for many years after planting, for the plants flower best when firmly established. It must be remembered, however, that this is one of the protected plants in New York State; supplies are best obtained from nurseries offering seeds or root cuttings.

It has been observed that ants help in the dissemination of Bloodroot seeds. These insects are apparently attracted to the seeds by a transparent gelatinous crest attached to the seed.

FUMARIÀCEAE, the Fumitory Family

This is a small family of the north temperate zone, with some 19 genera and about 425 species, closely related to and by some authors united with the Papaveraceae. Cronquist (1968) remarks that "Most of the characters which mark the Fumariaceae as a separate group within the order represent phylogenetic advances over the characters of the Papaveraceae," but he observes that "It may be more prudent to regard the two families as parallel groups which show different individual specializations." The family is distributed mostly in the old world, primarily in temperate Eurasia; three genera have indigenous representatives in the United States. They are herbaceous, sometimes lianous, plants with watery sap and alternate leaves, rarely subopposite, usually much divided or dissected. The family is of little economic importance except for the few ornamental species, Bleeding Heart being the most important. Fumitory (Fumaria) was once esteemed for its reputed medicinal properties; and in England, boiled in water, milk, or whey, it was used as a cosmetic. The root of an allied species, *Corydalis tuberosa*, known as radix aristolochia, was used medicinally for various cutaneous and other disorders, but no fumitory is currently considered of any medicinal value.

Key to Local Genera of the Fumariaceae

1. Corolla with 2 opposite petals spurred or saccate at base, 2
   2. Plant climbing; petals firmly united; corolla spongy, persistent, flesh color, scarcely saccate; seeds not crested.. *Adlumia*
   2. Plant low, erect, scapose; petals slightly united; corolla not spongy, deciduous, white or pink; seeds crested........ *Dicentra*
1. Corolla with but 1 petal spurred or saccate at base, 3
   3. Corolla pink with yellow tips; pods oblong, several-seeded, dehiscent; seed with a crest or aril; biennial........... *Corydalis*
   3. Corolla red-purple with dark red summit; pods globular, 1-seeded, indehiscent; seed without a crest; annual......... *Fumaria*

Adlùmia Raf. Mountain-fringe.

There are two species of *Adlumia*, the second one occurring in Korea. Ours is a handsome, delicate climbing biennial vine with thrice-pinnate leaves, cut-lobed leaflets, and drooping axillary panicles of pearly pink or purplish flowers. The name of the genus commemorates Major John Adlum, 1759-1836, an American horticulturist and amateur botanist.

Adlùmia fungòsa (Ait.) Greene. Alleghany-vine.

Meaning of Species Name. Spongy.

Other Names. Mountain-fringe, Climbing Fumitory, Canary-vine, Fairy-creeper, Cypress-vine.

Type of Plant. A climbing biennial herb.

Habitat. Wet or recently burned woods and rocky wooded slopes.

Range. Que and Ont to Wis and Minn, s to Del, NC, Tenn, and Ind, chiefly in the mts.

Distr in NYS. Infrequent or local across the state from L Champlain to St Lawrence co, outside the Adirondacks, westw and southw.

Distr in the Torrey Range. NY: Very rare on the n shore of LI, unknown on SI, rare in n Westchester co, thence increasing northw.

Elevation. Sea level-3365 ft in the Torrey range.

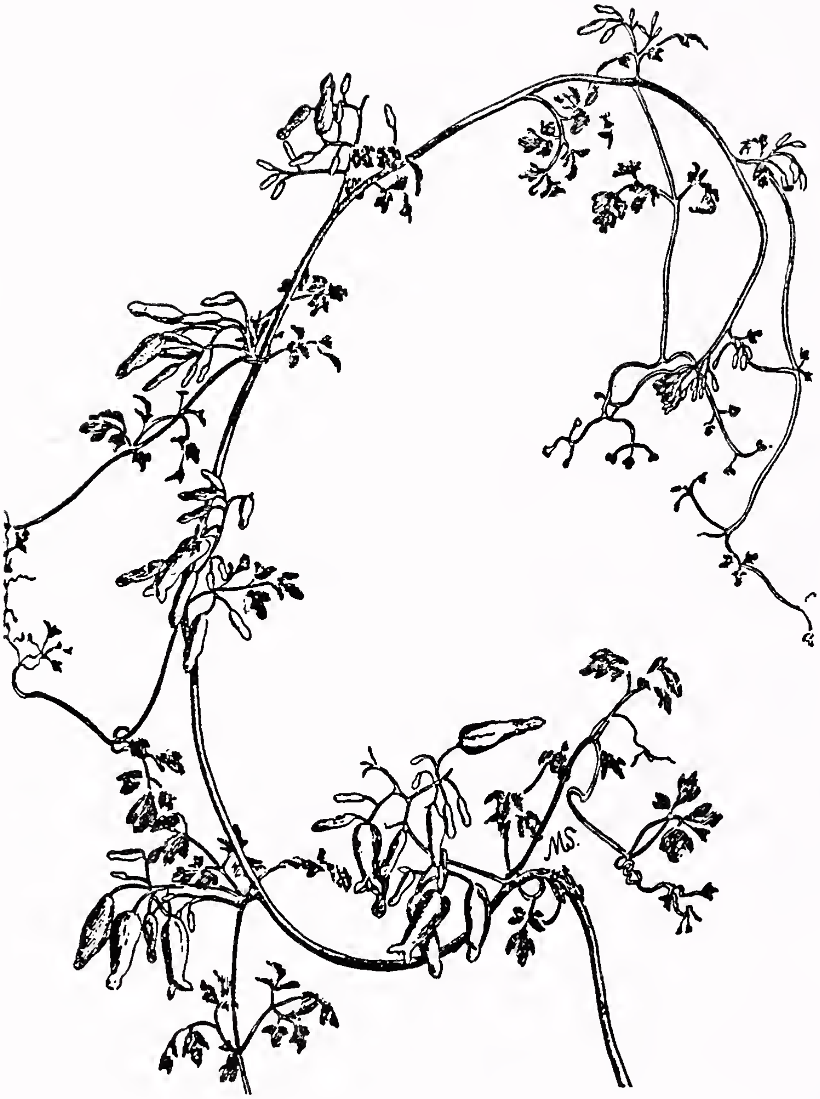
Time of Fl. Jun-Oct; Jun at Cornell.

Origin. Native.

Remarks. Often cult and frequently esc.

Corydàlis Medic. Corydalis.

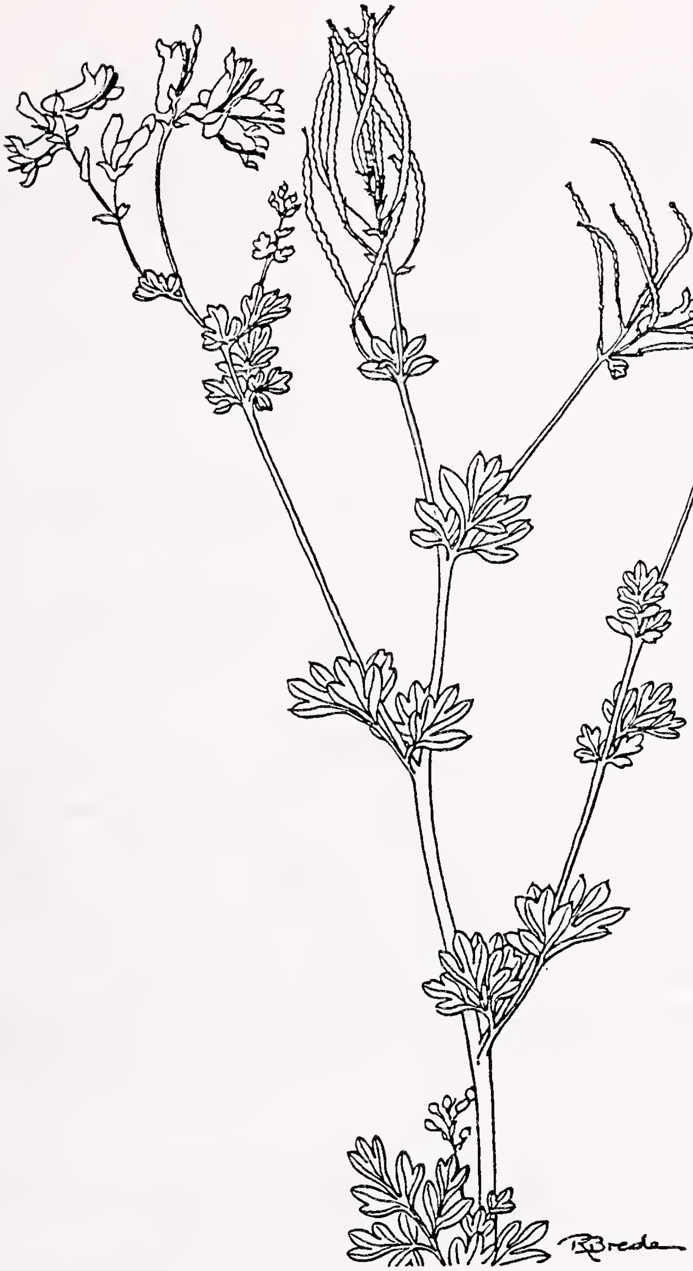
There are about 100 species of *Corydalis*, chiefly of the north temperate zone, most abundant in Eurasia; several others occur in our western states. They are hardy annual, biennial, or perennial herbaceous plants



Adlumia fungosa--Alleghany-vine
[From Dana (1900), Plate 116, p. 267.]

producing flowers during early summer. The name of the genus is derived from korudalios, the Greek name of the crested lark, in allusion to the crested petals, or, by some, considered as alluding to the spur of the flower. Some species are of horticultural value because of their attractive leaves. Johnson (1867) reported that C. bulbosa, Fumewort, has a tuberous root, which, when boiled, furnished the Kalmuck Tartars with a starchy substance much eaten by them. At least one species of this genus was employed as a medicinal plant by the American Indians, placing the root of C. aurea on coals and inhaling the fumes to clear the head and relieve the patient.

Several widespread species are toxic to farm animals. Kingsbury (1964) reports that since they often grow in regions where sheep and cattle are grazed extensively, these animals are frequently fatally poisoned, but species of Corydalis occur so infrequently in the Catskills that the danger of farm animals being poisoned by eating these plants is remote in spite of the fact that they are relished by both sheep and cattle.



Corydalis sempervirens--Pale Corydalis
[From Smith (1966), Plate 65, p. 152.]

Corydàlis sempervírens (L.) Pers. Pale Corydalis.

Meaning of Species Name. Evergreen or overwintering.

Other Names. Rock-harlequin, Pink Corydalis, Roman Wormwood.

Type of Plant. A very glaucous annual or biennial herb, reproducing by seeds.

Habitat. Dry or rocky woods and recent clearings.

Range. Nf to Ak, s to Pa, Ga, Tenn, Ind, Ill, Minn, Mont, and BC.

Distr in NYS. Common across the n part of the state and southw throughout the Hudson valley, the Catskill mts, and the Mohawk valley; less frequent or rare westw to L Erie; not reported from either LI or SI.

Distr in the Torrey Range. NY: Unknown on LI and SI, rare and local in Westchester co and the Bronx, thence increasing and becoming common northw.

Elevation. Grows to 4500 ft in NC; sea level-3200 ft in the Torrey range.

Time of Fl. May-Sep; May 15-Jun at Cornell.

Origin. Native.

Remarks. Taylor and House to the contrary, this is not a common plant in the Catskill region.

Dicéntra Bernh. Bleeding-heart.

There are about 20 species of Dicentra, natives of North America and eastern Asia, 8 of which occur in the United States and Canada. The name of the genus is derived from the Greek dis, double, and kentron, a spur, referring to the corolla. This genus consists of low, often stemless, perennial herbs (as in our wild species) with ternately compound and dissected leaves and nodding racemose flowers with 2-bracted pedicels.

The common garden Bleeding Heart (D. spectabilis) is a beautiful spring-flowering plant, a native of eastern Asia that is commonly cultivated for its attractive, deeply cut foliage and handsome flowers. Its foliage dies down and the plant is dormant for a period at about midsummer. D. formosa, a western species, is suitable for the rock garden, while D. exima, an attractive eastern North American species, blooms freely from spring through fall and thrives in ordinary garden soil, preferring a slightly shaded place. Both D. canadensis and D. cucullaria are suitable for woodland gardens and shaded rock gardens. Both are spring bloomers, about 6 inches tall, and have tiny tubers which in spring develop foliage and flowers; the foliage dies down immediately after the blooming season and does not reappear until the following spring.

In his "Report on Medical Botany," published in 1852, Dr. A. Clapp reported that both Squirrel-corn (D. canadensis) and Dutchman's-breeches (D. cucullaria) were supposed to be stimulant, diuretic, and diaphoretic. They were then used to increase urine flow, as a tonic, and applied as a poultice in the treatment of cutaneous diseases. Some physicians also used them as a substitute for mercury compounds in treating venereal diseases. The dried tubers of both species were official in the National Formulary, 1916-47, primarily for use as a tonic. Extracts from these plants were also employed by veterinarians as preanesthetics for larger animals.

Both species contain several alkaloids which are poisonous to farm animals, and Kingsbury (1964) reports that losses in cattle grazing in early spring woodland pastures have been reported sporadically for many years, primarily from Virginia and Indiana. Cattle find them distasteful but will eat them when other food is scarce. Poisoning is said to be most frequent after heavy rains, when the soil is soft and the tubers are most likely to be pulled up and eaten with the leaves. Both species are quite common in the Catskills; cattle should therefore be kept out of the woods unless there is plenty of other forage for them to eat. The danger is usually past by the end of May, but in some areas poisoning may occur in June.

Key to Local Species of Dicentra

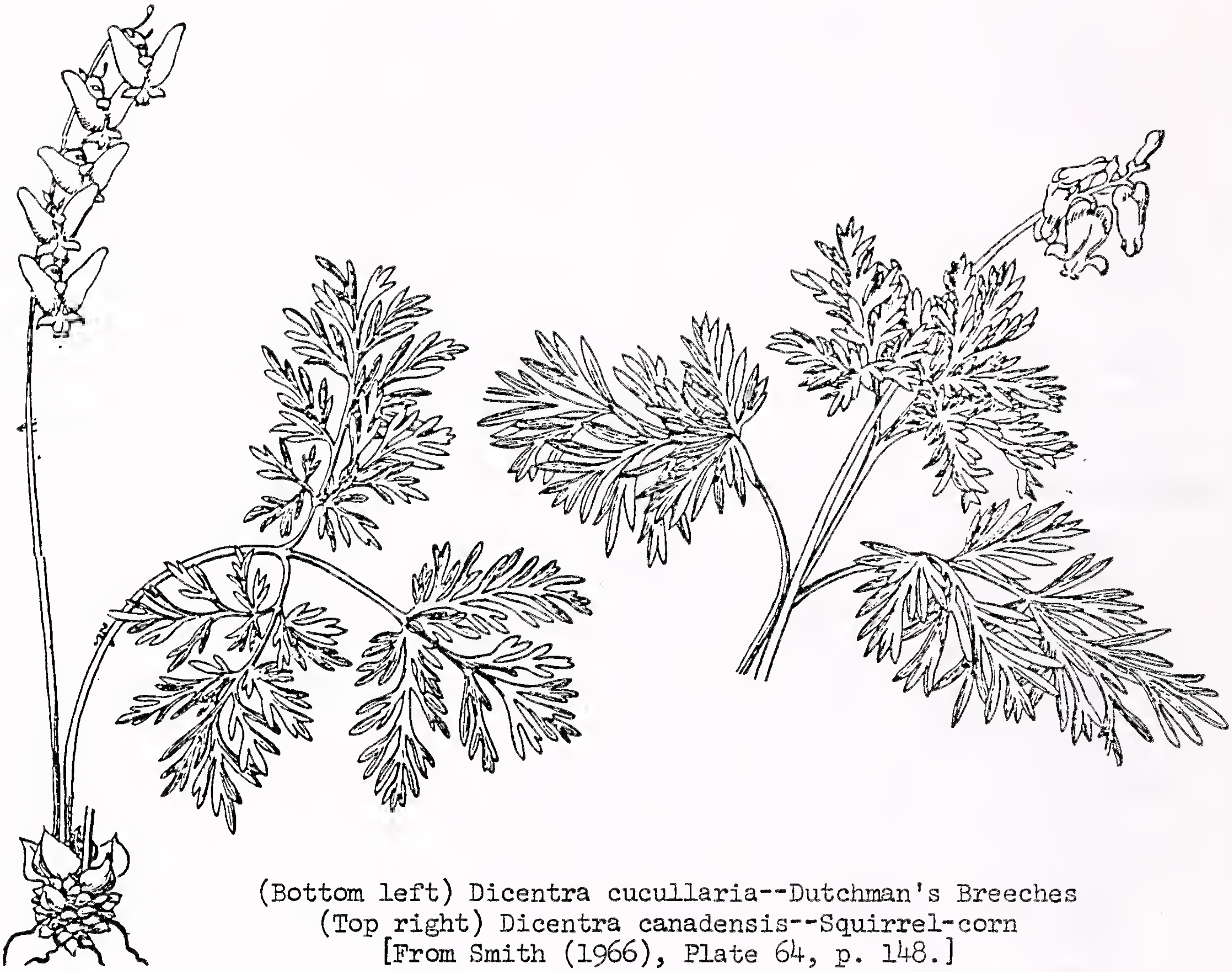
1. Flowers merely cordate at base, the spurs rounded; flowers fragrant; crest of the inner petals conspicuous; stem and leaves arising from a filiform horizontal rhizome bearing a cluster of yellow pealike corms or tubers; lower surface of leaves strongly whitened or glaucous, the tips of the segments more or less rounded but mucronate.. *D. canadensis*
1. Flowers divergently 2-spurred at base, the spurs prolonged and arching; flowers not fragrant; crest of the inner petals minute; stem and leaves arising from a fleshy, pink or white, loosely scaly tuber or thickened leaf bases, the scaly parts pointed; lower leaf surfaces pale greenish or slightly glaucous, the tips of the segments acutely pointed............................ *D. cucullaria*

Dicéntra canadénsis (Goldie) Walp. Squirrel-corn.

Meaning of Species Name. Canadian.
Other Names. Turkey Corn, Turkey-pea, Colic-weed, Wild Hyacinth, Staggerweed, Bleeding Heart, Shone Corydalis, Corydalis.
Type of Plant. A perennial herb.
Habitat. Rich woods.
Range. Que and NS to Minn, s to NC, Tenn, and Mo.
Distr in NYS. Common or frequent northw across the state and westw to L Erie; rare in the lower Hudson valley but frequent in the Catskills and uncommon or local in the southern tier of counties bordering on Pa.
Distr in the Torrey Range. NY: Unknown on LI and in the Bronx; formerly collected on SI; Slide Mt, Ulster co.
Elevation. Sea level-4020 ft in the Torrey range.
Time of Fl. Apr-May; Apr 30-May 20 at Cornell.
Origin. Native.
Remarks. Steyermark (1963) reports that after being transplanted to wildflower gardens this species generally requires several years to reestablish itself; only leafy stems appear for a number of years.

Dicéntra cucullària (L.) Bernh. Dutchman's Breeches.

Meaning of Species Name. An old generic name meaning hoodlike.
Other Names. Breeches-flower, Soldier's Cap, Monkshood, Colic-weed, Bachelor's-breeches, Little-boy's-breeches, Kitten-breeches, Boys-and-girls, Indian Boys-and-girls, White-hearts, Butterfly-banners, Ear-drops.
Type of Plant. A perennial herb.
Habitat. Rich woods.
Range. Gaspé Pen and Que to Minn and ND, s to NC, Ga, Ala, Mo, Ark, and Kan; Wash and Ore.
Distr in NYS. Common across the state outside the higher Adirondacks and n of the coastal plain.
Distr in the Torrey Range. NY: Unknown on LI, rare on SI, increasing and common northw.
Elevation. Sea level-3365 ft in the Torrey range; grows to 4500 ft in Va.
Time of Fl. Apr-May(early Jun); Apr 15-May 10 at Cornell.



(Bottom left) Dicentra cucullaria--Dutchman's Breeches
(Top right) Dicentra canadensis--Squirrel-corn
[From Smith (1966), Plate 64, p. 148.]

Origin. Native.

Remarks. The flowers resemble a pair of baggy trousers, whence the popular name.

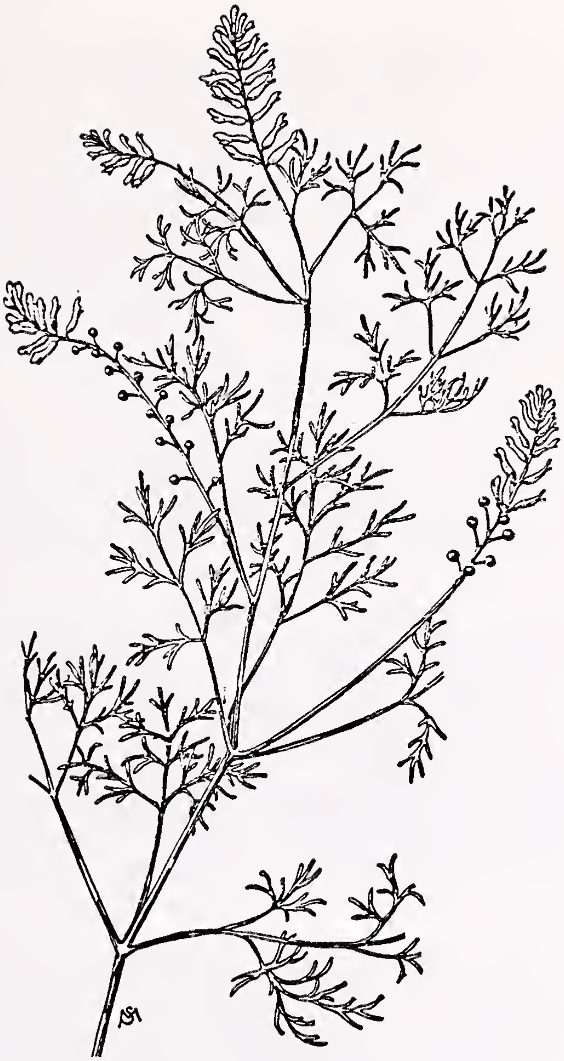
Fumària L. Fumitory.

This is a genus of about 40 species, all natives of the old world with much-branched stems bearing finely dissected compound leaves and small flowers in dense racemes or spikes. The name of the genus is derived from the Latin fumus, smoke, of doubtful significance, but possibly, according to Fernald (1950), "from the nitrous odor of the roots when first pulled from the ground."

Fumaria officinalis L. Earth-smoke.

Meaning of Species Name. Of the shops, from its early repute in medicine.

Other Names. Common Fumitory, Hedge Fumitory.



Fumaria officinalis--Earth-smoke
[From Matthews (1912), p. 165.]

Type of Plant. An annual herb, reproducing from seeds.
Habitat. Cult and waste ground.
Range. Local in the ne states.
Distr in NYS. Occasionally as an esc from cult.
Distr in the Torrey Range. An uncommon adv near cities and towns.
Elevation. Collected at 1400 ft in Delaware co.
Time of Fl. May-Aug(Sep); Jun at Cornell.
Origin. Adv from Eu.

Grieve (1967) remarks that one interesting peculiarity about this plant is that it is seldom visited by insects, adding that "It is self-fertile, and sets every seed." It seems to be a rather uncommon plant in the northeastern states, but in some areas it has a reputation for spreading with great rapidity; it is reported to have smothered a wheat crop in New South Wales. Cows and sheep will eat it, however, and the latter are said "to derive great benefit from it."

The flowers can be used to make a yellow dye for wool, but its reputation is more firmly rooted in the literature on its use as a medicinal plant. The U.S. Dispensatory of 1865 states that "Both in ancient and modern times fumitory has been esteemed a valuable remedy in visceral obstructions, particularly those of the liver, in scorbutic affections, and in various eruptive diseases." It was considered "gently tonic, alterative, and, in large doses, laxative and diuretic." Grieve (1967) remarks that "French and German physicians still prefer it to most other medicines as a purifier of the blood," but it seems to be no longer considered of any medicinal value.

CRUCIFERAE, the Mustard Family

The latest comprehensive treatment of the Mustard family recognized 350 genera with about 2500 species. The family is cosmopolitan in distribution but better represented in temperate and frigid zones, especially in the northern hemisphere, than in the tropics or in regions of high rainfall. Among the largest genera are Alyssum, Arabis, Cardamine, Draba, and Lepidium, all represented in the northeastern states and adjacent Canada. There are about 50 genera in North America, many species having been introduced from Europe as weeds. The pungent taste or odor of some species has led to their cultivation for food, among which may be included Brassica, Raphanus, Armoracia, and Lepidium; the seeds of some species of Brassica are valued for their oil, and a number of species are cultivated for ornament. Other species have been weeds since prehistoric times and have followed the development of agriculture over Europe and to America and other parts of the world.

This family of flowering plants derives its name from the cruciform arrangement of the four petals of the flower. It is now regarded as a comparatively recent evolutionary development from the Capparidaceae, although some authorities have suggested that it may have been derived from papaveraceous ancestors. Cronquist (1968) places this family in his order Capparales, consisting of five families and nearly 4000 species, more than three-fourths of which belong to the Cruciferae (3000), and most of the rest to the Capparidaceae. He observes that the Cruciferae and Capparidaceae "have many features in common." He likewise states that most authors agree that the Cruciferae are derived directly from the Capparidaceae, adding that the Capparidaceae "have all the characters that would be required in a hypothetical common ancestor of the Cruciferae, Moringaceae, and Resedaceae." This is a family of annual, biennial, or perennial herbs, rarely subshrubs, with a watery sap; forked or stellate unicellular hairs are commonly present; the leaves are usually alternate, and the bisexual flowers are typically racemose. The family is characterized by the presence of 4 sepals, 4 petals diagonally disposed, the usually tetradynamous stamens (4 longer than the other two), and the single sessile and seemingly bilocular ovary, with parietal placentation. Many are annuals, among which are some of the commonest weeds of cultivation, including Shepherd's-purse, Hedge Mustard, and Garlic Mustard. Others are biennials producing a number of leaves on short stems during the first year, and in the second sending up a flowering shoot at the expense of the nourishment stored in the thick taproot during the previous season. Under cultivation this root becomes much enlarged, as in Radish and Turnip. The petals are generally white or yellow, more rarely rose, lilac, or some other color, and honey glands are located between the bases of the stamens, indicating that pollination is effected by insects.

Economically the family is of considerable importance for the food crops, weeds, and ornamentals that belong to it. Among the important food crops are Cabbage, Cauliflower, Broccoli, Rutabaga, Kohlrabi, Chinese Cabbage, Turnip, Brussels Sprouts, and Mustard (all from Brassica), Radish (Raphanus), Watercress (Nasturtium), and Garden Cress (Lepidium). Weeds of economic significance include mustards (Brassica, Barbarea), Shepherd's-purse (Capsella), and Peppergrass (Lepidium). Two condiments, Mustard (Brassica) and Horseradish (Armoracia) belong to this family. Woad (Isatis) affords a blue dye. Among the ornamentals (about 50 genera are cultivated domestically), Wallflower (Cheiranthus, Erysimum), Honesty (Lunaria), Sweet Alyssum (Lobularia), Basket-of-gold (Alyssum), Rock Cress (Arabis), Stocks (Matthiola), Rocket (Hesperis), and Candytuft (Iberis), are perhaps most familiar.

Members of the Mustard family are not ordinarily considered as poisonous plants. Probably most of the common weeds are harmless in the young stages and are frequently grazed by cattle and sheep without harm. Muenscher (1949), however, states that many common weeds produce seeds rich in one or more glucosides, which under certain conditions liberate mustard oil or similar substances. Feed made from grain screenings containing large amounts of seeds of any of these mustards may cause considerable trouble when fed to horses, cattle, or pigs, for mustard oils are strong irritants that could result in chronic enteritis, diarrhea, colic, abortion, apathy, and paralysis of heart and respiration.

Gleason (1952) lists 48 genera of the Cruciferae as growing in the northeastern United States and adjacent Canada. Fortunately for the amateur botanist, only 20 genera are represented in the Catskill flora, but learning to recognize even these few may at first glance seem to represent a rather formidable task. It may therefore be helpful to present an overview outlining basic characteristics by which these genera can be separated into groups. Although the professional botanist depends primarily upon characters of the mature fruit to identify the various genera of this family (and mature fruit should be collected when one comes across a critical species), the color of the flower and the nature of the basal and cauline leaves are also diagnostic. Fortunately, in most genera both flowers and fruit are usually available at the same time. The 20 genera of the Catskill Cruciferae can be divided into groups as follows:

1. Petals yellowish to orange, 2
   2. Leaves nearly all simple, not deeply divided

      Alyssum
      Arabis
      Camelina
      Erysimum
      Rorippa

   2. Leaves, at least the lower, deeply pinnatifid, lyrate, or pinnate, 3

3. Pubescence stellate

Descurania

3. Pubescence of simple hairs or wanting

Barbarea
Brassica
Raphanus
Rorippa
Sisymbrium

1. Petals purple, pink, or white, 4
   4. Leaves (or the larger ones) deeply pinnatifid, lyrate, pinnate, or palmately divided

Cardamine
Lepidium
Nasturtium
Raphanus

4. Leaves all or nearly all simple, not deeply divided, 5
   5. Flowering stems arising from a definite basal rosette

Arabidopsis
Arabis
Capsella

5. Flowering stems without definite basal rosettes

Alliaria
Armoracia
Berteroa
Cardamine
Hesperis
Lepidium
Lunaria
Thlaspi

This overview should enable the amateur botanist quickly to determine to which group his specimen belongs. He can then refer directly to the corresponding section of the following key, which includes all 20 genera of the Catskill crucifers. Whenever possible, plants bearing nearly full-grown fruit should be collected; immature plants are often difficult to key out.

Key to Flowering Material

1. Petals yellowish to orange, 2
   2. Leaves all or nearly all simple, not deeply divided, 3
      3. Flowering stems arising from a definite rosette or with rosettes borne on basal offshoots (rosette leaves pubescent or scurfy; flowering stem leafy to or above middle; cauline leaves, at least the lower, sagittate-clasping)..... Arabis

3. Flowering stem without definite basal rosette, 4

4. Cauline leaves (at least the lower) clasping (style elongate; inflorescence of simple elongate racemes; pedicels not reflexed; stem glabrous at least toward summit; flowers 4-6 mm long)........................... Camelina

4. Cauline leaves not clasping, 5

5. Plant glabrous or with simple hairs (flowering stem usually leafy nearly to summit; sepals spreading; ovary short)................................ Rorippa

5. Plant (especially leaves and young stems) closely pubescent with appressed stellate or bifurcate hairs, 6

6. Pubescence of many-pronged hairs; stems 1-3 dm high; silicles (short seed pods) orbicular, 3-4 mm long... Alyssum

6. Pubescence of 2-3-pronged hairs; stems 1-13 dm high; siliques (long seed pods) subterete, slender, 1-2.5 cm long..................................... Erysimum

2. Leaves, at least the lower, deeply pinnatifid, lyrate, or pinnate, 7

7. Pubescence stellate; leaves finely dissected; flowers small.. Descurania

7. Pubescence of simple hairs or wanting, 8

8. Petals 10-20 mm long, 9

9. Ovary and silique with corky transverse partitions separating the ovules and seeds; petals conspicuously veined.. Raphanus

9. Ovary and silique without corky separating partitions; petals usually not conspicuously veined...... Brassica

8. Petals 0.5-10 mm long, 10

10. Cauline leaves clasping the stem by deeply pinnatifid bases; plants perennial (rarely annual) with crowded overwintering basal leaves......................... Barbarea

10. Cauline leaves not clasping; if so, with entire or shallowly toothed bases and plant annual or biennial with overwintering rosette much loosened or wanting during anthesis, 11

11. Sepals erect during anthesis; petals 6-10 mm long; ovary and silique with prominent beak.... Brassica

11. Sepals loosely spreading during anthesis; petals 0.5-8 mm long; ovary and silicle without prominent beak, 12

12. Annuals or biennials of weedy and dry habitats; sepals linear to narrowly oblong; style very short and thick or none; ovary slenderly linear to subulate, with each valve 1-3-nerved.. Sisymbrium

12. Perennials to annuals chiefly of damp or aquatic habitats; sepals ovate to elliptic; style definite, usually slender; ovary short and broad, the valves nerveless...................... Rorippa

1. Petals purple, pink, or white (sometimes yellow at base), 13

13. Leaves (or the larger ones) deeply pinnatifid, lyrate, pinnate, or palmately divided, 14

14. Cauline leaves 2-3, palmately compound or deeply cleft (flowers rather large; rhizomes fleshy, toothed or jointed; early maturing woodland plants)........................... *Cardamine*

14. Leaves principally pinnatifid, lyrate, or pinnate, not palmate, 15

  15. Petals 10-20 mm long, 16

    16. Slender perennial, glabrous, with pinnate leaves; leaflets of lower leaves petiolulate; plants of meadows, grasslands, and springy spots............ *Cardamine*

    16. Coarse annuals or biennials, more or less hispid with stiff hairs; lower leaves runcinate, pinnatifid, or lyrate; plants of disturbed soils............... *Raphanus*

  15. Petals 0.5-8 mm long (or wanting), 17

    17. Ovary ovate to orbicular (flowering stems leafy, simple or forking; petals 0.5-2 mm long; plants relatively small, erect or ascending, with long racemes terminating stem and branches.............. *Lepidium*

    17. Ovary slenderly linear (plants glabrous or with some simple hairs; leaves simply pinnate or pinnatifid; petals white or pinkish), 18

      18. Succulent perennial with prolonged stems rooting in water; petals 4-5 mm long; pedicels after anthesis promptly divergent or recurving....... *Nasturtium*

      18. Hardly succulent; flowering stems growing from basal rosettes (these sometimes disappearing before maturing of fruit); petals 1.5-4 mm long; pedicels spreading-ascending to suberect...... *Cardamine*

13. Leaves all or nearly all simple, not deeply divided, 19

  19. Flowering stems arising from a definite rosette or with rosettes borne on basal offshoots, 20

    20. Cauline leaves not sagittate at base, 21

      21. Annual or winter-annual with slender tap-root and soft base; style obsolete; weed of fields and roadsides................................... *Arabidopsis*

      21. Biennial or perennial with strong bases or crowns; if seemingly annual with definite styles, mostly natives of rocky habitats.......................... *Arabis*

    20. Cauline leaves sessile, with sagittate bases, 22

      22. Ovary inverted-triangular or cuneate.............. *Capsella*

      22. Ovary slender, elongate............................ *Arabis*

  19. Flowering stems without definite basal rosettes, 23

    23. Cauline leaves clasping the stem (ovary flat, notched at summit), 24

      24. Pubescent; petals 1.5-2 mm long; fruit 2.5-6 mm long; seeds solitary in each locule; crushed leaves with no unpleasant odor................................... *Lepidium*

      24. Glabrous; petals 3-4 mm long; fruit 1-1.4 cm long; seeds 3-8 in each locule; crushed leaves with unpleasant odor.................................... *Thlaspi*

    23. Cauline leaves not clasping, 25

      25. Ovary short, lanceolate to ovate or rounded, 26

        26. Leaves hoary with stellate hairs (petals deeply cleft)............................ *Berteroa*

26. Leaves glabrous or with mostly simple hairs, 27
27. Petals 1-2 mm long (or wanting); ovary flat; annuals or rarely perennial.................................. *Lepidium*
27. Petals 5-8 mm long; ovary plump; coarse perennial... *Armoracia*
25. Ovary elongate, slenderly linear or cylindric, 28
28. Cauline leaves deeply cordate, deltoid-ovate, long petioled; bruised plant with odor of onion or garlic.............. *Alliaria*
28. Cauline leaves rounded, tapering, or short-auricled at base, narrower, sessile or short-petioled; plants without onion or garlic odor, 29
29. Blades of petals raised above sepals on very long slender claws (plant hispid or hirsute; cauline leaves numerous, lanceolate to ovate, sharply toothed; flowering pedicels 5-10 mm long; sepals 5-9 mm long)................... *Hesperis*
29. Blades of petals not raised above sepals; cauline leaves few, blunt and blunt-toothed (perennials of spring-heads, rills, or wet woods)............................. *Cardamine*

Learning to identify the Catskill crucifers is further simplified by the fact that 12 of the 21 genera are represented by only one species each, most of which are rather easily recognized plants:

Alliaria
Alyssum
Arabidopsis
Armoracia
Camelina
Capsella
Descurania
Erysimum
Hesperis
Lunaria
Nasturtium
Thlaspi

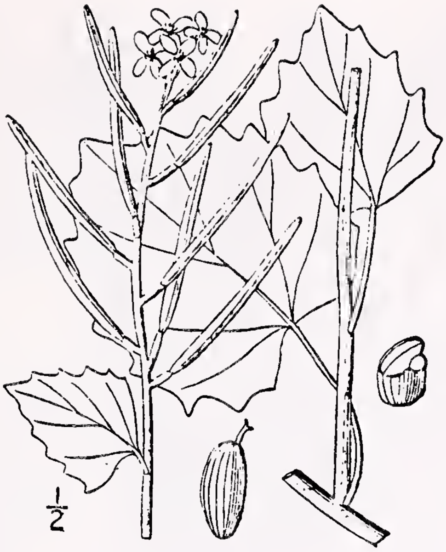
Key to Fruiting Material of Genera Represented by Two or More Species

1. Leaves palmately divided or cleft into 3 or more leaflets or segments; rhizome fleshy, toothed or jointed (*Dentaria*)...... *Cardamine*
1. Leaves simple, pinnatifid, or pinnate, 2
2. Fruit a silicle, at most 4 times as long as broad, 3
3. Fruits or their locules indehiscent or very tardily dehiscent, or separating merely by transverse partitions (fruits elongate, 2-4 cm long; plant hispid, of fields and waste ground)..................................... *Raphanus*
3. Fruit longitudinally dehiscent, the falling valves splitting to expose the thin septum and seeds, 4
4. Silicle globose to ovoid, obovoid, or ellipsoid, scarcely if at all flattened; petals yellow (cauline leaves not sagittate, mostly pinnate or pinnatifid)... *Rorippa*
4. Silicle obviously flattened; petals white or wanting (fruits in racemes), 5
5. Silicle flattened parallel to the broad septum; fruit few-seeded; silicle not notched at summit (seeds winged; petals deeply cleft)....................... *Berteroa*
5. Silicle flattened contrary to the narrow septum; seeds 1 in each locule; silicle notched or emarginate at summit.................................... *Lepidium*
2. Fruit a silique, 4 to many times as long as broad, 6

6. Siliques indehiscent or disarticulating by cross-partitions into seed-bearing joints (plants hispid, of fields and waste places)... *Raphanus*
6. Siliques longitudinally dehiscent, the falling valves exposing the seeds and the septum, 6
   7. Flowering stem arising from a definite rosette of basal leaves, 7
      8. Leaves deeply pinnatifid or pinnate (siliques flattened; petals white to purple)................................ *Cardamine*
      8. Leaves simple, undivided or merely sinuate or lyrately lobed, 8
         9. Hairs all simple or often quite wanting............... *Cardamine*
         9. Hairs of foliage, stem, etc. all or in part forking (siliques flattish, linear, 1.5-10 cm long)............. *Arabis*
   7. Flowering stem without definite basal rosette, 9
      10. Siliques flattened, 10
          11. Leaves and stems glabrous or with simple hairs; siliques 0.5-3 cm long....................................... *Cardamine*
          11. Leaves or stems usually bearing some forked hairs; siliques up to 10 cm long.............................. *Arabis*
      10. Siliques terete or 4-angled, 11
          12. Cauline leaves sagittate- or cordate-clasping, 12
              13. Silique tapering to a terete indehiscent beak 0.8-2 cm long; seeds globose......................... *Brassica*
              13. Silique very slender, tapering to a thick short style; seeds oblong or flat, 13
                  14. Leaves, or some of them, lyrate pinnatifid; petals deep yellow; seeds oblong to quadrate.. *Barbarea*
                  14. Leaves simple, not lyrate; petals pale yellow or creamy; seeds flat........................... *Arabis*
          12. Cauline leaves not clasping, 14
              15. Fruit terminated by a conical to flat or 3-angled indehiscent beak (seeds globose)................. *Brassica*
              15. Fruits dehiscent to tip, without long indehiscent beak (pubescence simple or wanting), 15
                  16. Perennials with creeping bases; leaves pinnate; valves of siliques nerveless (divisions of leaves lanceolate to linear, toothed or incised; petals yellow).. *Rorippa*
                  16. Annuals or biennials without creeping bases; leaves simple, merely toothed or pinnatifid or lyrate; valves of silique nerved, 16
                      17. Annual; flowers pale yellow; plant hirsute (sometimes sparsely) at least at base; stems terete................................. *Sisymbrium*
                      17. Perennial or biennial; flowers bright yellow; plants usually glabrous; stems angulate-corrugate................................ *Barbarea*

Alliària Scop. Garlic-mustard.

There are two species of *Alliaria*, one of Europe and one of western Asia. The name of the genus is derived from the Latin *allium*, onion, alluding to the odor of the plant. Our species is a biennial herb, a native of



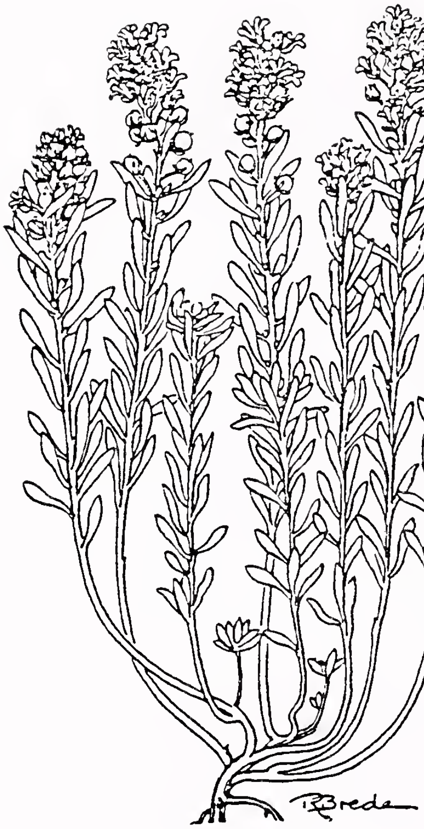
Alliaria petiolata--Garlic-mustard
[From Britton & Brown (1913), Vol. II, p. 170.]

Eurasia, with cordate deltoid-ovate toothed petioled leaves and small flowers.

Alliària petiolàta (Cav.) Bieb. Garlic-mustard.

Meaning of Species Name. With petioles.
Synonyms. A. officinalis Andruz. in Fernald (1950).
Other Names. Hedge-garlic, Garlic Root, Garlicwort, Mustard-root, Jack-by-the-hedge, Sauce-alone, Jack-in-the-bush, Poor-man's Mustard, Penny-hedge.
Type of Plant. A biennial herb, reproducing by seeds.
Habitat. Moist shaded soil of garden beds, roadsides, along railroads, waste places, and open woods near habitations.
Range. Local, Que to Ont, s to Va, Ky, and Kan.
Distr in NYS. Becoming frequent or common in some secs of the state.
Distr in the Torrey Range. Becoming frequent near the larger cities in the range and along the Hudson river railroad above Yonkers and near Roslyn, LI.
Time of Fl. (Apr)May-Jun.
Origin. Introd and natzd from Eu.

This plant, a native of Europe and adjacent Asia, is the "sauce-alone" of Gerarde, who remarked that "divers eat the stamped leaves hereof with salt fish, for a sauce, as they do those of ransons." The sauce, which has an odor of garlic, was also eaten with meat, as a filling for bread-and-butter sandwiches, mixed with lettuce as a salad, and as a stuffing for pork and fish. In other areas it was gathered when it approached the flowering state and boiled as a potherb to accompany boiled mutton. Of this species Johnson (1867) remarks that "It is used among the country people ... as a green vegetable, though not so much now as in former times, when there were fewer such plants cultivated in the cottage gardens. According to Neill,



Alyssum alyssoides--Small Alyssum
[From Smith (1966), Plate 66, p. 153.]

'when gathered when it approaches the flowering state, boiled separately, and eaten with boiled mutton,' it forms a desirable potherb. In Wales it is often fried with bacon or herrings, and is sometimes eaten as a salad; the people of northern Germany use it much, in the latter form, with their salt provisions in spring." When cows graze upon this plant, it imparts a disagreeable flavor to the milk.

Johnson also states that "The whole herb is diaphoretic and expectorant when fresh. The leaves were used by Boerhaave in a bruised state, as an application to gangrenous sores; he applied them with success, bruised with wine, to gangrene of the leg, resulting from a neglected fracture." The U.S. Dispensatory of 1865 likewise considered the herb and seeds to be diuretic, diaphoretic, and expectorant, sometimes prescribed for the treatment of asthma, chronic catarrh, and other complaints in which garlic was considered useful. The juice of the leaves, taken alone or boiled with honey to make a syrup, was sometimes used in the treatment of dropsy. When eaten as a salad, the herb "warms the stomach and strengthens the digestive faculties."

Alýssum L. Alyssum.

This genus comprises about 100 species, almost entirely natives of Eurasia, chiefly the Mediterranean region, middle Europe, and the Caucasus. They are mostly low-growing hardy annual or perennial herbs bearing racemes of yellow or yellowish flowers. The name of the genus is derived from the Greek *a*, not, and *lyssa*, madness, from the supposed usefulness of some species as a cure for rabies. Several species are in cultivation as ornamental plants, some of which are valuable in the rock garden while others are used for edging flower beds. A favored kind is *Alyssum saxatile*, Basket-of-gold. The Sweet Alyssum so long cultivated by gardeners under the name *Alyssum maritimum* has been transferred to the genus *Lobularia*.

Alýssum alyssoìdes L. Small Alyssum.

Meaning of Species Name. An old generic name meaning "like Alyssum."
Other Names. Yellow Alyssum, Heal-bite, Heal-dog.
Type of Plant. An annual herb, reproducing from seeds.
Habitat. Fields, roadsides, and waste places.
Range. Que to BC, s to NJ, Ky, Ind, Minn, Utah, and Cal.
Distr in NYS. In 1924 reported from Ithaca, Monroe co, and about NYC.
Distr in the Torrey Range. Occasional as a weed in most parts of the range.
Elevation. Collected at 1400 ft in Delaware co.
Time of Fl. Apr-Jun; May 20-Jun 20 at Cornell.
Origin. Adv from Eu.

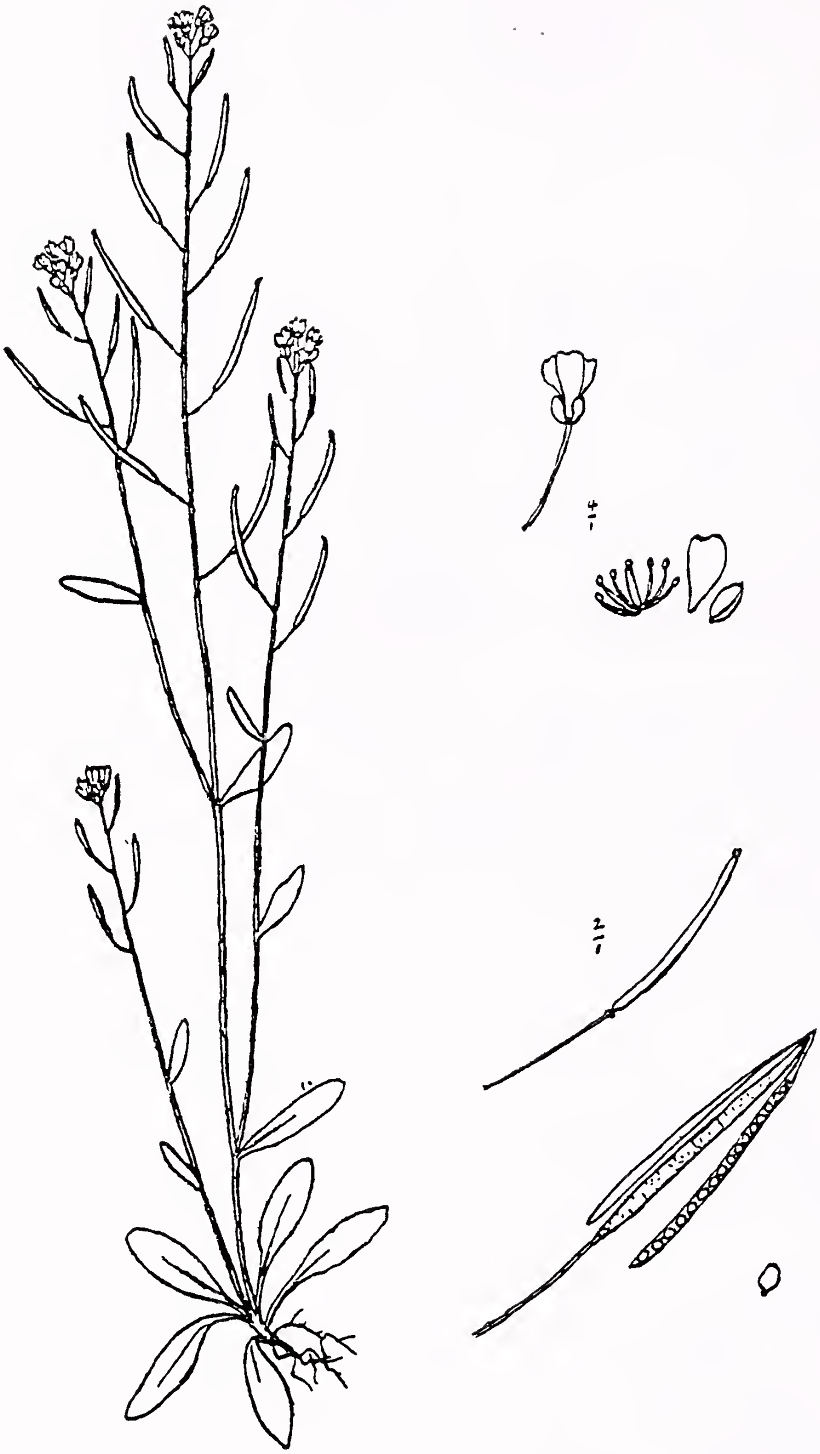
Something of the nature of this plant can be gained from observations made by Baskin and Baskin (1974), who remark that "In Kentucky where we have studied the species, *A. alyssoides* is a winter annual ... Seeds germinate in summer and early autumn, but only seedlings from autumn-germinating seeds survive. After germination in autumn a semi-rosette is formed, and the plants overwinter in this condition. Flowering and seed production occur the following spring, and mature seeds are dispersed in late spring and early summer."

Arabidópsis Heynh. Mouse-eared Cress.

There are about 13 species of *Arabidopsis*, almost all of which are Eurasian species. They are annual or biennial herbs with basal rosettes of petioled leaves. The name of the genus is derived from *Arabis* and *opsis*, aspect, from its resemblance to the genus *Arabis*.

Arabidópsis thaliàna (L.) Heynh. Mouse-eared Cress.

Meaning of Species Name. Named for Johann Thal, who described it in the 16th century.
Other Names. Thale-cress, Wall-cress, Turkey-pod.
Type of Plant. An annual or winter annual herb.
Habitat. Dry fields, roadsides, and waste places, especially in sandy soil.
Range. Mass to Mich, Ill, and Wis, s to Ga and Ark.
Distr in NYS. Infrequent or locally abundant across the state, chiefly southw.
Distr in the Torrey Range. Common throughout the area.
Time of Fl. Mar-Jun.



Arabidopsis thaliana--Mouse-eared Cress
[From Stone (1945), Vol. I, p. 663.]

Origin. Natzd from Eu.
Remarks. More abundant southw.

Árabis L. Rock-cress.

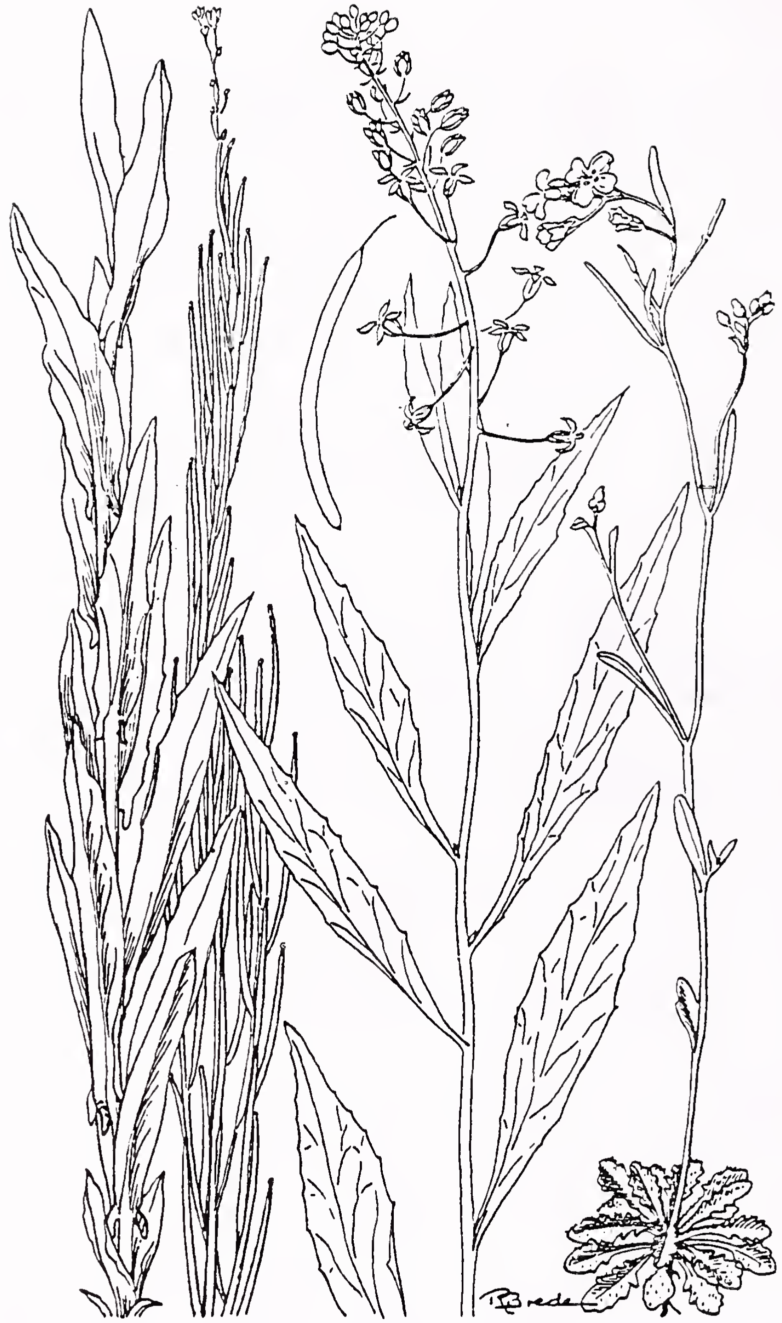
There are more than 100 species of Arabis, widely distributed in the north temperate zone, chiefly in the Mediterranean region, eastern Europe, and Asia Minor, but Rollins recognized 53 species in western North America. The name of the genus is an ancient one of doubtful derivation, usually supposed to have been applied to some crucifer from Arabia. Collections should invariably include full-sized fruits and the base of the stem; flowers and basal leaves are also useful in identification. They are hardy annual, biennial, or perennial, often low-growing spring-flowering plants with small white, pink, or purple flowers borne in terminal spikes or racemes. Some species are useful for the rock garden or as an edging for beds of spring flowers. Those species commonly cultivated include A. albida, or Wall Cress, a low-growing, free-blooming plant that bears masses of white flowers in early spring. A. billardieri has gray-green leaves and pale rose-colored flowers, while A. blepharophylla, a native of California, has fragrant rose-purple flowers.

Key to the Catskill Species of Arabis

1. Cauline leaves sagittate- or auriculate-clasping, 2
   2. Flowering stem glabrous and glaucous throughout; petals white (fruits flat, widely spreading, usually somewhat decurved, nerveless or faintly nerved only to the middle)........ A. laevigata
   2. Flowering stem hirsute, at least at base, with spreading, mostly simple hairs; petals creamy to yellowish; fruits mostly erect, 3
      3. Stem hirsute at base; mature siliques terete; seeds wingless or very narrowly winged; cauline leaves mostly glabrous; style thick.. A. glabra
      3. Stem hirsute to summit; mature siliques flat; seeds winged, broadly so above; lower cauline leaves hirsute; style usually slender....................................... A. hirsuta
1. Cauline leaves tapering to base, not clasping, 4
   4. A tufted biennial or perennial, 0.7-3.5 dm tall, diffusely branched above; basal leaves conspicuously pinnatifid; racemes lax, with erect to spreading pedicels; valves 1-nerved only to above the middle; seeds oblong or elliptical, very small, wingless.. A. lyrata
   4. A stout erect biennial 3-9 dm tall, simple or sparingly branched above; basal leaves entire, toothed or lobed, not pinnatifid; pedicels becoming pendulous and finally subgeniculate; valves definitely 1-nerved nearly or quite to the attenuate tip; seeds orbicular, larger, more or less winged................ A canadensis

Árabis canadénsis L. Sicklepod.

Meaning of Species Name. Canadian.
Type of Plant. A biennial herb.
Habitat. Rich woods, thickets, and rocky banks.
Range. Me to Minn and Neb, s to Ga. Ala, Ark, Okla, and Tex.
Distr in NYS. Frequent across the state s of the Adirondacks.
Distr in the Torrey Range. NY: Not very common on LI and SI,



(Left) Arabis glabra--Tower-mustard
(Middle) Arabis canadensis--Sicklepod
(Right) Arabis lyrata--Lyre-leaved Rock-cress
[From Smith (1966), Plate 71, p. 161.]

increasing northw and becoming common in the Hudson highlands; in 1915 not reported from the Catskills.

Elevation. Sea level-1800 ft in the Torrey range; grows to 4200 ft in NC.

Time of Fl. (Apr)May-Jun(Jul), fr Jun-Sep; fl Jun-Aug at Cornell.

Origin. Native.

Árabis glàbra (L.) Bernh. Tower-mustard.

Meaning of Species Name. Smooth.
Other Names. Tower Cress.
Type of Plant. A biennial herb, reproducing by seeds.
Habitat. Ledges, cliffs, thickets, fields, and rocky places, usually in dry soil.
Range. Que to Ak, s to NC, WVa, Ark, NM, and Cal; also in Eurasia.
Distr in NYS. Widely distr across the state outside the higher Adirondacks; usually appearing as a weed and as though introduced.
Distr in the Torrey Range. NY: Reported from LI, apparently not recorded from SI; rare and local on the upper end of Manhattan, thence increasing but not common northw.
Elevation. Sea level-2180 ft in the Torrey range.
Time of Fl. May-Jun(Jul), fr Jun-Jul; fl Jun-Jul at Cornell.
Origin. Native.
Remarks. Often a weed that seems to be becoming increasingly common in the Catskills.

Árabis hirsùta (L.) Scop. Hairy Rock-cress.

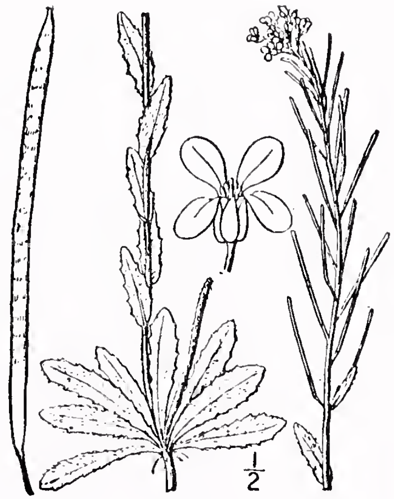
Meaning of Species Hame. Hairy.
Habitat. Moist or dry woods, rocky or sandy places, dry banks, and ledges, chiefly in calcareous soil.
Range. Que to Ak, s to Pa, Ind, Ark, Ariz, and NM; also in n Ga.
Distr in NYS. Infrequent.
Distr in the Torrey Range. NY: The limestone regs of Columbia and Dutchess co, and at Riverdale.
Elevation. Sea level-1400 ft in the Torrey range.
Time of fl. May-Jun, fr Jun-Jul; fl May 20-Jun 10 at Cornell.
Origin. Native.
Remarks. A variable circumboreal species.

Árabis laevigàta (Muhl.) Poir. Smooth Rock-cress.

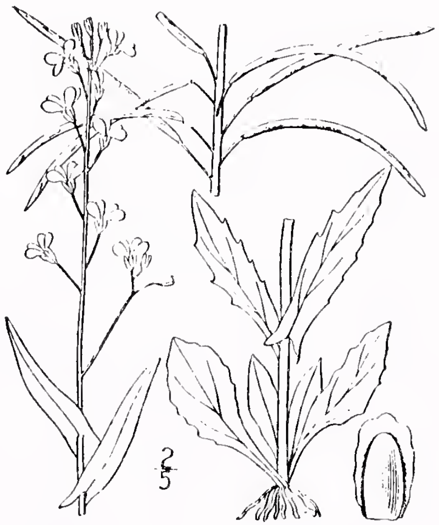
Meaning of Species Name. Smoothed.
Type of Plant. A biennial herb, reproducing by seeds.
Habitat. Moist or dry rich rocky woods, slopes, hillsides, and shaded (chiefly calcareous) ledges.
Range. Que to Minn, SD, and Col, s to Ga, Ala, Ark, and Okla.
Distr in NYS. Frequent across the state northw, less common or rare southw to the lower Hudson valley.
Distr in the Torrey Range. Through the range except in the pine barrens, wanting in them and rare in the surrounding area; common northw.
Time of Fl. (Apr)May-Jun(Jul), fr May-Sep; fl May 20-Jun at Cornell.
Origin. Native.

Árabis lyràta L. Lyre-leaved Rock-cress.

Meaning of Species Name. Lyre-leaved.
Type of Plant. A tufted biennial or perennial herb.

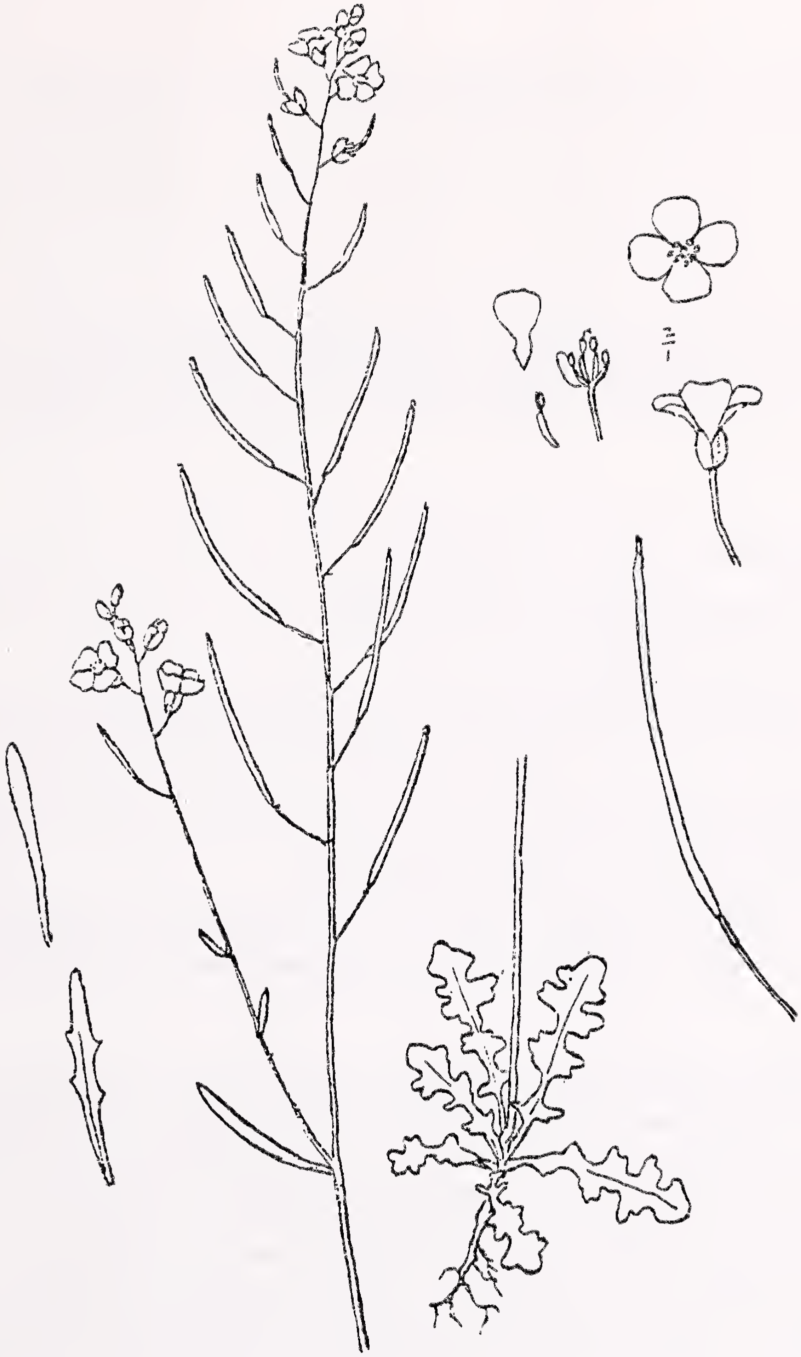


Arabis hirsuta--Hairy Rock-cress



Arabis laevigata--Smooth Rock-cress

[From Britton & Brown (1913), Vol. II, p. 181.]



Arabis lyrata--Lyre-leaved Rock-cress
[From Stone (1945), Vol. I, p. 677.]

Habitat. Dry woods and fields, ledges, cliffs (basic or circumneutral), gravels, and sands.

Range. Vt to Ak, s to NC, Ga, Ky, Tenn, and Mo; in the w to Wash; also in e Asia.

Distr in NYS. Locally abundant or common across the n part of the state outside the higher Adirondacks, and from L Champlain southw to Putnam co and the s Catskills, westw to the lake reg of c and w NY.

Distr in the Torrey Range. Throughout the area except in the pine barrens, there rare or wanting; most abundant northw.

Elevation. Grows to 2500 ft in Va.
Time of Fl. (Apr)May-Jun(Jul), fr May-Jul; fl May 20-Jul 15 at Cornell.
Origin. Native.

Armoràcia Gaertn. Horseradish.

There are four known species of Armoracia, three of Eurasia and one of North America. The genus name is derived from armorachia, the ancient Greek name of the Horseradish. They are perennials of the northern hemisphere with deep roots or rhizomes, either undivided or pinnatifid leaves, and white flowers.

Armoràcia lapathifòlia Gilib. Horseradish.

Meaning of Species Name. Dock-leaved.
Type of Plant. A perennial herb.
Habitat. Moist ground.
Range. Spread from cult throughout the ne states and adjacent Canada.
Distr in NYS. Esc from gardens into moist ground, especially along streams.
Distr in the Torrey Range. Not a very common esc from cult in most parts of our range.
Time of Fl. May-Jul; May-Jun at Cornell.
Origin. Introd and natzd from Eu.
Remarks. Rarely produces viable seed, therefore considered to be an interspecific hybrid rather than a natural species, a view supported by cytological evidence; sometimes a pernicious weed.

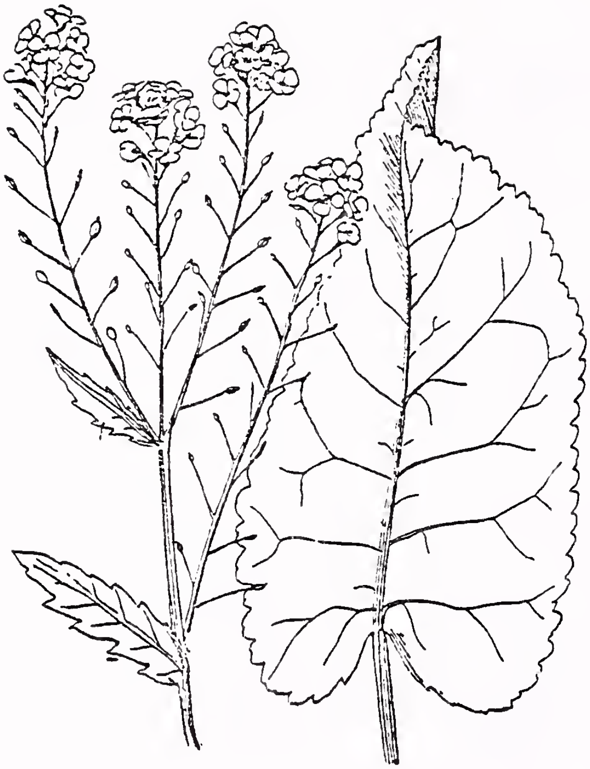
Horseradish has a long and venerable history. It is one of the five bitter herbs (along with Coriander, Lettuce, Horehound, and Nettles) that the Jews traditionally eat at Passover with cooked lamb and unleavened bread. Because this plant is mentioned by Dioscorides (1st century A.D.) but not by Theophrastus (about 372-287 B.C.), however, De Candolle concluded that Horseradish has been in cultivation for less than 2000 years. He also considered that it originated in temperate eastern Europe, the wild plant occurring from Finland and Poland to the Caspian Sea, the deserts of Cuman, and Turkey. Strangely enough there is no mention of the use of Horseradish as a food or seasoning among the ancient Greeks or Romans. Although they were familiar with the plant, they evidently considered it of use only as a medicinal plant.

Pliny, writing in the first century A.D., praises its medicinal powers but fails to mention its use as a food. Both the leaves and roots were eaten in Germany during the Middle Ages, and it appears to be the raphanus of Albertus Magnus, who lived during the 13th century; he mentions the plant as being both wild and cultivated, but its use was probably then restricted to medicinal purposes. Late in the 16th century we find mention by one of the herbalists that it was used by the Germans "as a sauce to eate fish with and such like meates as we do mustarde," but its use as a condiment did not then become popular in England, for in 1640 an English writer damns it with faint praise, stating that it was used only by "country people and strong laboring men," it being "too strong for tender and gentle stomachs." Johnson (1867), on the other hand, remarks that "though grown in distant times in the convent herb-gardens, and afterwards much valued by the dispensers of herb-physic, it does not seem to have been used as an esculent before the days of Gerarde ... During the following century it must have been employed here as a condiment, however, for Robert Turner, in his 'British Physician,' published in 1687 ... says that it was then eaten with fish and 'other meats' like mustard. Its name is now indissolubly connected with that of British roast beef, and its roots form a necessary crop in every kitchen garden." Courter and Rhodes (1969) report that at least two types of Horseradish were known in the 16th century; one type had leaves with an acute base, while the other had leaves with a cordate base. These characteristics have persisted and can still be found in cultivars grown today.

Early settlers from Europe brought plants with them to this country, and it was common in gardens in the northeastern states in the early 1800's; McMahon included it in his 1806 list of garden esculents. The plant soon escaped to waste areas and was reported growing wild near Boston in 1840. It is still in general cultivation in this country for market purposes, the chief areas of intense cultivation being located in the Mississippi valley around St. Louis, Missouri, and Eau Claire, Wisconsin. The thick, fleshy, white root is currently highly prized, when ground and mixed with vinegar and salt, as an appetizing and pungent condiment to enhance the flavor of boiled and roast beef. When mixed with catsup, it also imparts a refreshing taste to seafood, particularly clams, oysters, and shrimp. In the northeastern states this member of the Mustard family is often found growing "wild" around old house foundations, where it may have been first planted over a century ago from cuttings originally brought from Europe. The large leaves account for the name "horse," meaning any plant that is large and coarse.

The roots can be dug at any time of the year so long as the ground is not frozen, and if a supply of roots is gathered in late autumn and stored in wet sand in a cool cellar, one can have a supply of fresh roots all winter. To prepare Horseradish, select firm white crisp roots; grate them fine, and add enough vinegar to make it the consistency of custard. Freshly ground Horseradish is more comfortably made in an electric blender. One-eighth cup of vinegar is added as 1/2 cup of the root, cut into small pieces, is whirled about, adding a few pieces at a time. It can be served plain with beef or boiled tongue, but for serving with pork, some people like to add 1 1/2 teaspoons of ground dry mustard with each batch. The flavor of prepared Horseradish can also be varied by adding 1/2 teaspoonful of crushed dill seed, aniseed, or oregano. Its fierce pungency can be toned down by adding 1/2 cup of diced cooked beets to 1/2 cup of diced Horseradish before mixing them together in the blender. The pungent oil is highly volatile so it is best to make only a small amount at a time, as it quickly loses its potency in a few weeks. It is best preserved in vinegar and put in a tightly covered jar stored in the refrigerator. One unusual recipe for Horseradish sauce calls for 1/2 pint of cream whipped very stiff, during which 1 teaspoon of garlic salt is sprinkled over it as the cream is being whipped. Two tablespoons of freshly ground, frozen, or bottled Horseradish are then folded into the cream, the mixture being kept in the refrigerator until the last possible minute before serving.

Horseradish also has other uses, for the first leaves that come up in



Armoracia lapathifolia--Horseradish
[From Pammel (1913), p. 169.]

the spring, gathered when young and tender, make one of the finest available salad greens or boiling greens. The tender young leaves are particularly good in liverwurst sandwiches; chopped fine, they will also add a distinct character to any tossed salad. For boiled greens many people prefer to mix Horseradish leaves with other greens such as Nettles or Winter Cress, as Horseradish is rather "emphatic" when used alone. The water clinging to the freshly washed leaves is all the cooking water they need when used with Nettles; Winter Cress should be parboiled and the first water thrown away before adding the Horseradish leaves. Cook 15 or 20 minutes, season with butter or bacon fat, a little salt, and a sprinkle of cider vinegar for a delicious serving of boiled greens. Be sure not to throw away whatever juice there may be left in the pot. It is rich in vitamins A and C (it has twice as much Vitamin C per 100 grams as orange juice) as well as in many of the trace minerals essential to good health; either serve it with the greens or add it to a soup.

While the chief use of Horseradish is as a condiment to promote both appetite and digestion, it has also long been employed medicinally. As a medicinal herb both root and leaves were for centuries recommended for use in the treatment of many illnesses. Such multiple claims are more reasonably made for Horseradish than for most other herbs, for it is classed as a stimulant, rubefacient, diuretic, antiscorbutic, diaphoretic, vermifuge, and expectorant. Even modern writers have claimed that it will prevent kidney stones if eaten regularly. For the same reason it was used to treat dropsy when the fluid accumulations were caused by too scanty a flow of urine. Dr. W. T. Fernie, writing in 1879, reported that it was a corrective for digestion when eaten with oily fish or fatty meat, and by the medical theory of counterirritants, the root was rubbed on rheumatic or palsied limbs and held against the face to relieve the agony of neuralgia. It was also said to prevent infestations of intestinal worms and to expel them when they were already present.

Being rich in vitamin C, it was formerly an important antiscorbutic, in part because it could be obtained in winter at a time when the common diet of dried and salted foods caused scurvy to become a serious disorder among large segments of the population. While it probably never cures a common cold, it can promote perspiration, loosen congestion, and relieve sore throat, hoarseness, and coughing. Used externally, grated Horseradish has been used as a rubefacient, replacing the more drastic mustard plaster. One herbalist stated that "If bruised and laid on the part grieved with sciatica, gout, joint-ache or hard swellings of the spleen and liver, it doth wonderfully help them all." One physician found advantage, in cases of hoarseness, from the use of a syrup prepared from an infusion of Horseradish and sugar, slowly swallowed in the quantity of 1 or 2 teaspoonfuls, repeated as occasion warranted.

Gibbons (1966) experimented with Horseradish as a medicine for use in the treatment of such viral infections as influenza and prepared a drink made up of 2 tablespoons of grated Horseradish, 2 tablespoons of honey, a dash of nutmeg, and a twist of orange peel, all stirred into a pint of claret wine that had been heated to 160° F in the top of a double boiler. This was given to the patient in wineglassful doses as hot as he could drink it four times a day (the wine was reheated each time it was given). He also made a remedy for hoarseness and sore throat by infusing 1 tablespoon of vinegar and 2 tablespoons of grated Horseradish in 1/3 cup of water for about 1 hour. To the carefully strained liquid he added 2/3 cup of honey, which was administered in doses of 1 teaspoonful every hour until the symptoms were relieved.

Old herbals often recommended soaking 1 part of grated Horseradish in 4 parts of fresh milk for 1 hour for use as a skin freshener, a remedy which might well have been effective, since Horseradish root contains a large percentage of sulphur. Gibbons also experimented with a skin-freshener formula and came up with an effective after-shave lotion by adding 1/2 cup of grated Horseradish to 2 cups of distilled Witch-hazel water and letting it stand over night. To the strained liquid he added 1/2 cup of commercial rubbing alcohol, 1/4 cup of white vinegar, and a generous dash of cologne.

Kingsbury (1964) reports that cases of loss of cattle, horses, and pigs have been recorded in Great Britain resulting from eating the tops as well as the roots of this plant, both under pasture conditions and from Horseradish roots thrown to swine in garbage. Raw Horseradish root amounting to only 1 percent of body weight produced death in swine within 3 hours, death resulting from acute inflammation of mucous membranes of the stomach. Excitement and pain were followed by collapse and death.

It is extremely difficult to eradicate Horseradish completely from any site it has occupied, owing to the fact that the smallest piece of root left in the ground will ultimately form a new plant. One method of keeping it under control when planting it in a new location is to plant the roots in large drainpipes set upright in the prepared ground.

Barbarèa R. Br. Winter Cress.

There are about 12 species of Barbarea, natives of Eurasia and North America. They are biennials or perennials with overwintering basal rosettes, cauline leaves with clasping bases, and yellow flowers. The name of the genus commemorates St. Barbara, of the fourth century. In the Middle Ages it was called the Herb of St. Barbara, the seed of B. verna, according to some authorities, being sown in western Europe near St. Barbara's day, in early December. Other authorities state that since B. vulgaris has the unusual habit of growing vigorously during warm periods in winter, it derived its Latin name Barbarea from the fact that in many parts of Europe this was the only green plant that could be gathered for food on December 4, St. Barbara's Day--an important consideration in medieval Europe when fresh vegetables were practically nonexistent during the winter. B. arcuta, Bitter Cress, still serves as a food plant in parts of Europe and Asia.

Key to Local Species of Barbarea

1. Beak of silique (seed pod) slender, 1.5-3 mm long; pedicels slender; uppermost leaves incised, coarsely dentate, angulate, or lobed, but rarely pinnatifid; basal leaves with 1-4 pairs of lateral lobes or simple.. B. vulgaris
1. Beak thickish, 0.5-1 (rarely 2) mm long; pedicels as thick as the pod; uppermost leaves usually lyrate-pinnatifid or at least not angulate-dentate; basal leaves with 4-10 pairs of lateral lobes. B. verna

Barbarèa vérna (Mill.) Aschers. Early Winter Cress.

Meaning of Species Name. Of early spring.
Other Names. Scurvy-grass, Bank-cress, American-cress, Bermuda-cress, Belle-Isle Cress.
Type of Plant. A biennial or perennial herb, reproducing by seeds.
Habitat. Damp soil of meadows, fields, roadsides, and waste places.
Range. Nf to Wash, s to Fla and Cal.
Distr in NYS. Rare as an esc or adv in s and e NYS and a few other widely scattered localities across the state.
Distr in the Torrey Range. Rare in most parts of our area except the pine barrens, there perhaps wanting; in 1915 not definitely known from the Catskills.
Time of Fl. (Late Mar)Apr-May(Jun); May 10-Jun 15 at Cornell.
Origin. Natzd from Eu.

This species is the cultivated "Scurvy-grass," Belle-Isle Cress, or Early Winter Cress of the market, especially in the southern states; its seeds are sometimes offered in seed catalogs. It is also grown in the gardens of England and Germany as a cress for use in winter and spring salads. In some areas it is an abundant weed of fields and roadsides in early spring, but, although readily available, it is mostly unknown to or ignored by people who might use it as a source of food.

In areas where this species has become an undesirable weed, it can be controlled by the same methods as those outlined for B. vulgaris.

Barbarea verna--Early Winter Cress
[From Medsger (1947), p. 151.]

Barbarèa vulgàris R. Br. Winter Cress.

Meaning of Species Name. Common.
Other Names. Yellow Rocket, St. Barbara's Cress, Bitter Cress, Spring Cress, Upland Cress, Rocket Cress, Yellow-weed, Water-mustard, Pot-herb, Winter-rocket, Wound-rocket, Herb Barbara.
Type of Plant. A biennial or perennial herb, reproducing by seeds and sometimes by new shoots from old crowns.
Habitat. Damp soil of meadows, brooksides, fields, roadsides, gardens, and woods, especially on rich alluvial soil.
Range. Nf to Ont, s to Va, WVa, O, Ind, Ill, Mo, and Kan.
Distr in NYS. Frequent or common in most secs of the state. Northw in moist open places and on shores of ponds and lakes it appears indigenous; regarded southw in the state as being natzd from Eu.
Distr in the Torrey Range. Common as a weed throughout the area.
Time of Fl. Apr-Jun(Aug); May-Jun at Cornell.
Origin. Natzd from Eu, at least in the Catskill region.

Winter Cress has been in use for many centuries, according to one authority having been cultivated by the early Egyptians, the Greeks, and the Romans. It was long cultivated in England and Scotland as an early salad plant. The natives of New Zealand used this plant as a food and in Sweden the leaves are boiled as a kale. It was included in a list of American garden esculents published in Philadelphia in 1806, and in 1832 one writer stated that Winter Cress was used as a salad both in spring and fall and that it was by some boiled as a Spinach. Some consider the herb nauseous and bitter and in this country it has long since been banished from cultivation, but it is widespread as a rather noxious weed in the Catskills, where in early spring whole fields can be seen carpeted with its yellow blossoms. Having been introduced from Europe, it has since spread throughout the northeastern states and southern Canada, west to the Mississippi, with isolated areas in the north central states, Washington, and Oregon. Johnson (1867) remarks that "In Sweden the plant is boiled and eaten like cabbage, probably forming a very wholesome substitute for that vegetable ... The constant use of smoked and salted meat and fish in Scandinavia and other northern regions, especially during the long winter, renders recourse to herbs of an antiscorbutic tendency more frequently necessary than is the case in England ... Still there is no doubt that this ... might be advantageously employed by the poor in cold winters, when garden vegetables are scarce or expensive; the more frequent use of them would probably mitigate or wholly prevent those scorbutic and other cutaneous disorders, so prevalent among the lower classes after bad seasons."

In common with a few other plants, Winter Cress has the ability to grow vigorously during any warm spell in winter, so it is among the first green plants that can be gathered for fresh salad material or for boiled greens; in the Catskills it is usually at its best in early April, long before most other plants start to grow. When gathered early, the leaves are no more bitter than Endive of Escarole and can be used raw as a salad. Later in the season, however, after the frosty nights are past, the leaves become too bitter to eat raw. Excluding the light will keep the bitter principle from developing, so if a large cluster of leaves is tied together and a flower pot is then inverted over the clump, it will become blanched in about two weeks, providing crisp, tasty material for a salad, excellent by itself or mixed with other greens.

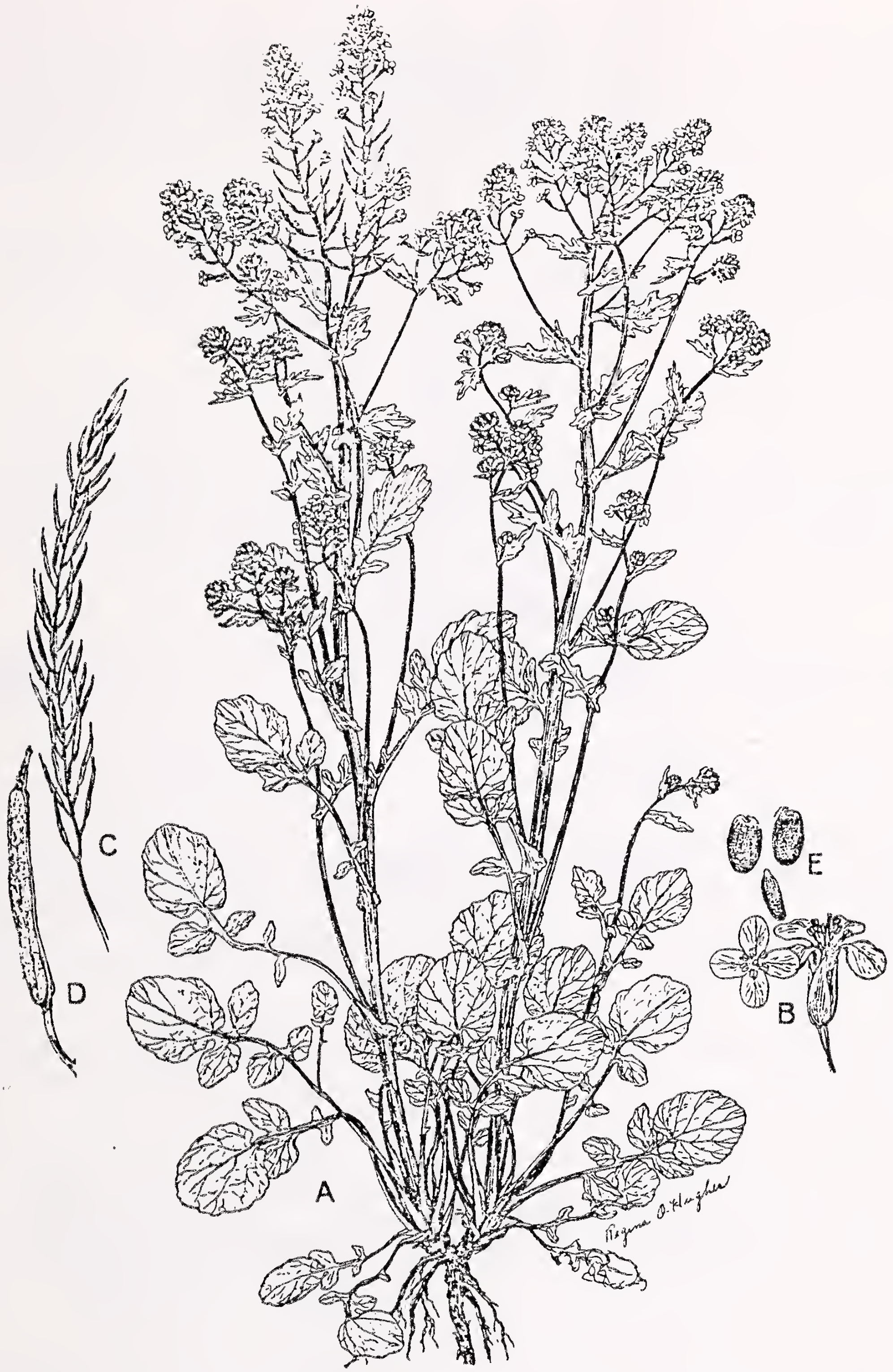
These greens can also be served boiled, cooked in exactly the same way as one would prepare Spinach, and they can be substituted in any recipe that calls for Spinach. As a matter of fact, the flavor of Spinach is much improved by the addition of a quantity of Winter Cress. If the greens have become bitter, cook them in two waters, throwing the first one away. When this is done, pour boiling water over the washed greens, bring to a boil over high heat, cook for about half a minute, then drain well, add fresh boiling water, and continue cooking until tender. They can then be seasoned with salt, pepper, butter, and vinegar, or one can crumble some crisply fried bacon over the top as a garnish.

Even the flower stalks are good to eat if they are gathered while the plant is still in bud, although a few open flowers do no harm. Preparation of this "wild broccoli" is simplicity itself; after washing the flower stalks, simply put them in a kettle, pour boiling water over them, let them stand for about half a minute, drain well, then cover with fresh boiling water, add a bit of salt and pepper, and cook not longer than 3 minutes. Drain again, check seasonings, dot with butter, and they are ready to serve. They are also good with hollandaise or soy sauce.

The seeds of this plant are of some value to wildlife, as they are eaten by both the mourning dove and the pine grosbeak.

Kingsbury (1964) reports one unusual case of poisoning in a horse which suggests that ingestion of relatively large amounts of this plant may produce gastroenteritis in farm animals.

In areas where this species has become an obnoxious weed, Muenscher (1952) suggests that scattered plants should be pulled or hoed out just as



Barbarea vulgaris--Winter Cress
[From USDA Agr. Research Sv. (1971), Fig. 93, p. 191.]

they begin to blossom, adding that "Badly infested fields should be disked or harrowed several times in late summer and early autumn to destroy the rosettes and to induce the seeds to germinate; plow under next spring and follow with a cultivated crop." In new meadows the tops should be mowed as soon as the flowers appear, making sure that the mower is set low enough to catch the lowest flower-stalks.

The double-flowered variety of this species, a European wild plant sometimes known as Double Yellow Rocket, is worth planting in the flower garden; it grows about 18 inches high and blooms in early summer, thriving in ordinary soil in a sunny place.

Bertero̖a DC. Hoary Alyssum.

There are seven species of Berteroa, all natives of the old world. The name of the genus commemorates Carlo Giuseppa Bertero, 1789-1831, an Italian botanist. They are tall leafy branching plants, separated from Alyssum by deeply cleft white petals and margined seeds.

Key to Local Species of Berteroa

1. Siliques (fruiting capsules) plump, roundish................ B. incana
1. Siliques flattish.. B. obliqua

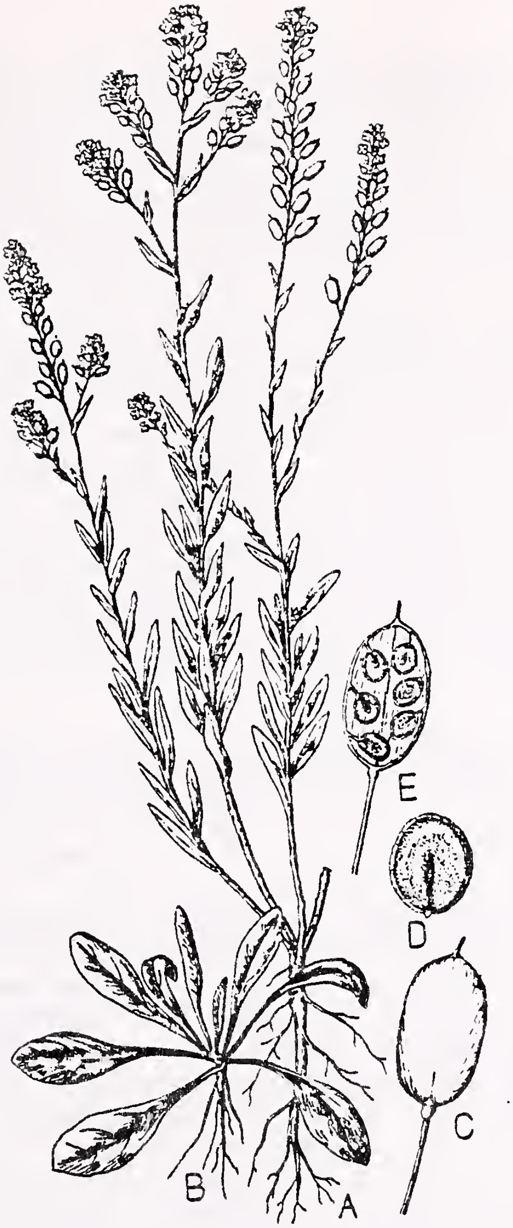
Bertero̖a inca̖na (L.) DC. Hoary Alyssum.

Meaning of Species Name. Hoary.
Type of Plant. A perennial or biennial herb, reproducing by seeds.
Habitat. Fields, meadows, pastures, and waste places, mostly on dry, sandy, or gravelly soils.
Range. NS to Minn and Mont, s to NJ, Pa, WVa, and Mo; also in the Pacific states.
Distr in NYS. Frequent or local about towns and cities.
Distr in the Torrey Range. Not uncommon as a weed near the larger towns and cities.
Time of Fl. (May)Jun-Sep; Jul 15-Aug at Cornell.
Origin. Natzd from Eu.

This species is now quite generally established as a weed, more abundant northw. In areas where Hoary Alyssum has become an undesirable plant, it can be controlled by pulling or hoeing out scattered plants, followed by clean cultivation.

Bertero̖a oblíqua (Sibth. & Sm.) DC. Berteroa.

Meaning of Species Name. Oblique.
Type of Plant. An annual herb.
Habitat. Waste places.
Range. A few scattered stations in NYS and doubtless elsewhere in the ne states.
Distr in NYS. Not listed in House (1924).



Berteroa incana--Hoary Alyssum
[From Muenscher (1952), Fig. 51, p. 274.]

Distr in the Torrey Range. Not listed in Taylor (1915)
Time of Fl. Jul-Aug.
Origin. Adv from s Eu.

Bráṣsica L. Mustard, Turnip.

There are about 50 species of Brassica (the Latin name of the Cabbage), all natives of the old world. This genus of the Mustard family is one of the most important from an economic standpoint, for many species have been in cultivation almost since agriculture began in very early times and have given rise to highly specialized modern forms, including such cultivated vegetables as Broccoli, Brussels Sprouts, Cabbage, Cauliflower, Chinese Cabbage, Collards, Kale, Kohl-rabi, Mustard, Rape, Red Cabbage, Rutabaga, Savoy Cabbage, and Turnip. They are annuals or biennials with yellow petals about three-eighths of an inch long and lyrate, incised, or pinnatifid lower leaves. Many species of this genus are also familiar weeds of cultivated ground or waste land. The young plants are popular in many areas as potherbs and the smoother-leaved species are sometimes used in salads.

The mustard seed of commerce is produced from several species of the genus *Brassica*. Of these, the principal species are Black Mustard, *B. nigra*, White Mustard, *B. hirta*, and Sarepta Mustard, *B. Juncea*. Both the white and black mustards are cultivated to some extent in various parts of England, Europe, and North America. White Mustard is also grown as a salad plant and has come into increasing favor in England as a forage crop or as a green manure; Black Mustard is grown solely for its seeds, which yield the condiment. Both Black Mustard and White Mustard were official in the *U.S. Pharmacopeia* until comparatively recently. Their principal use in medicine has been the external use of the ground-up seeds as plasters and poultices, but they were also administered internally for emetic and laxative purposes.

Martin *et al.* (1961) remark that only in the Pacific region, and particularly in California, do the mustards seem to play an important role as a source of food for wildlife. In that area the seeds of these plants, often fed to caged birds, are relished both by gamebirds and by songbirds.

Kingsbury (1964) reports that a number of *Brassica* species are poisonous to farm animals. In Great Britain both cattle and sheep have been poisoned by eating White Mustard (*B. hirta*). Mustard stubble, the podded plant, and the seeds in meal all produced symptoms of severe gastroenteritis, including severe pain, salivation, diarrhea, and irritation of the mouth and the upper digestive tract, sometimes terminating in death. The seeds and podded plants of Charlock (*B. kaber*) have also been responsible for the poisoning of sheep in Great Britain, and cattle and swine have been poisoned by this plant in Canada. In the case involving swine, the seeds were contained in ground meal to which they had been added as an adulterant. Other species of *Brassica* have likewise been suspected of poisoning farm animals, including the common cultivated Turnip, occasionally used for sheep or cattle fodder. Turnips frequently contain dangerous levels of nitrate and have been incriminated in the loss of cattle in the United States.

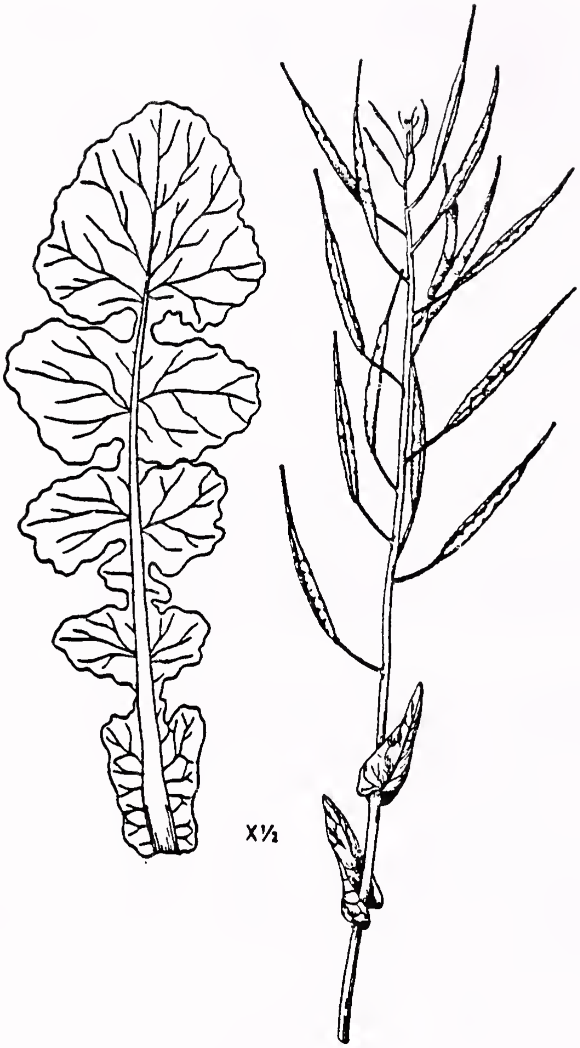
Key to the Catskill Species of Brassica

1. Upper cauline leaves clasping or at least with a broad sessile, rarely broadly cuneate base; foliage glaucous, glabrous or nearly so, more or less succulent (except *B. rapa*, with thinner green foliage, more or less setose-hispid); mature pods 3-8 cm long, 3-5 mm wide; pedicels spreading, 2
   2. Foliage glaucous, glabrous or the lower leaves with a few scattered whitish hairs; root slender; petals 8-11 mm long; annual... *B. campestris*
   2. Foliage green, rarely glaucous, more or less setose-hispid; root tuberous; petals about 7 mm long; biennial............ *B. rapa*

1. Upper cauline leaves tapering at base; foliage scarcely glaucous, glabrous or hairy, thin; pods 1-7 cm long, 1-5 mm wide; pedicels appressed or spreading, 3
   3. Valves of fruit with 1 prominent midnerve, the other nerves much weaker, scarcely parallel, often anastomising; beak much narrower than body of pod, one-ninth to one-quarter the total length of the fruit, terete or slenderly conical, not flattened, seedless; pods not constricted, 4
      4. Pods 2.5-7 cm long, more or less spreading; pedicels 7-10 mm long; plant low; fruits nearly or quite terete...... _B_. _juncea_
      4. Pods 1-2 cm long, appressed; pedicels 3-7 mm long; plant tall; fruit somewhat 4-angled by the very stout midnerves _B_. _nigra_
   3. Valves of fruit each with 3 parallel nerves of about equal strength; beak large, not much narrower than body of pod, one-fourth the total length of the fruit or more, flattened, usually containing a seed in the basal part (fruiting pedicels 4-7 mm long, stout; pods moderately slender, 2 mm in diameter, glabrous or rarely hispid, ascending; seeds usually 5-10 in each cell; leaves sparingly lyrate, the upper ones usually not divided.. _B_. _kaber_

Brassica is likely to be a difficult genus for the amateur. For that reason an alternate approach to the five species growing in the Catskills is provided in the following key:

1. The coles; plants thick-leaved, glaucous-blue or blue-green (sometimes glaucous-red), the herbage wholly free of hairs and spicules at maturity, except rarely somewhat pubescent on radical leaves; flowers large, 1-2.5 cm across, yellowish to white; sepals mostly erect; seed coats featureless, 2
   2. Root consistently tuberous and fleshy, biennial; flowering stem stout and strict, commonly not branching near base.......... _B_. _rapa_
   2. Root not tuberous or thick-fleshy; plants annual; flowering stems usually diffusely branching (stem leaves cordate-clasping; root usually branching or forking)............... _B_. _campestris_
1. The mustards; plants thin-leaved, green or only slightly glaucous, more or less pilose or spiculose; flowers small, mostly less than 5 mm broad, light to medium yellow; seeds conspicuously pitted; annuals, the root not tuberous, 3
   3. Pod long, usually 5 cm or more, widely spreading or divaricate at maturity; beak terete, without seeds.............. _B_. _juncea_
   3. Pod short, usually not exceeding 4 cm, more or less appressed to rachis, or nearly parallel to it, at maturity, 4
      4. Beak of pod conspicuously flat at maturity, often containing seeds, centrally ribbed, prominent; pedicel of pod very short and thick... _B_. _kaber_
      4. Beak slender and not prominent, neither flattened, seed-bearing, or noticeably ribbed; body of pod usually about 1.3 cm long; pedicel of pod very thin.................. _B_. _nigra_



Brassica campestris--Bird's Rape
[From Gleason (1952), Vol. II, p. 209.]

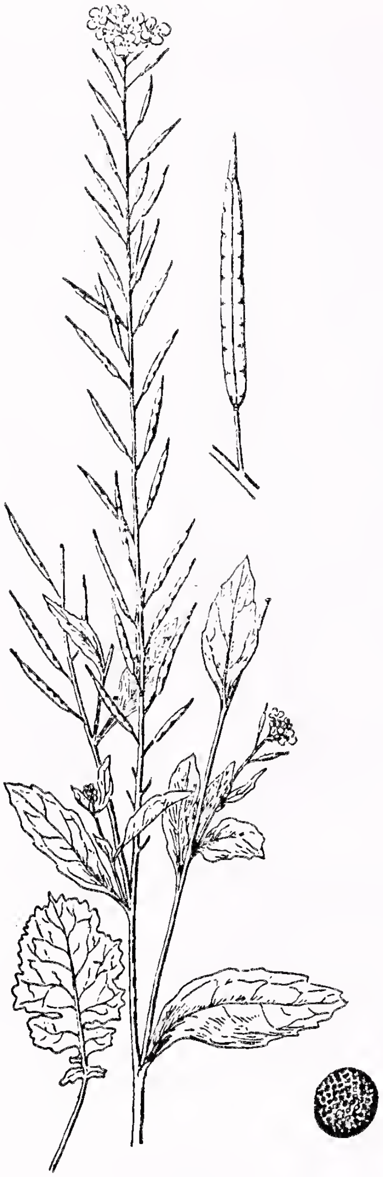
Brássica campéstris L. Bird's Rape.

Meaning of Species Name. Of the fields.
Synonyms. B. rapa L. in Fernald (1950).
Other Names. Field Mustard, Turnip, Summer-rape, Nape, Bergman's Cabbage, Cole-seed.
Type of Plant. An annual or biennial herb.
Habitat. Natzd as a weed of gardens, cult fields, and waste ground.
Range. Throughout the n states, adjacent Canada, and beyond.
Distr in NYS. Wild forms of the cult Turnip are not infrequent as weeds in cult or waste ground.
Distr in the Torrey Range. Not uncommon near the larger cities and along the edges of cult fields.
Time of Fl. (May)Jun-Oct; Jul at Cornell.
Origin. Natzd from Eu.

Several forms of plants included in the genus *Brassica* are known as Rape and cultivated as green crops for table use, as forage crops for animals, or for their oil-yielding seeds. Leafy varieties of *B. napus* are grown for forage in Europe and elsewhere while less leafy varieties of *B. napus* and *B. campestris* are grown for oilseed in Europe and Asia. Oils known in commerce as rape oil or colza oil may come from varieties belonging to either species. Summer Rape, an annual variety of *B. napus*, is an important oilseed crop in Europe while varieties of *B. campestris* are grown in India and China. Johnson (1867) remarks that "The Rape is largely grown both here and on the continent of Europe for its oleaginous seeds. They yield by expression about thirty-three per cent. of oil; which, though in its original state containing much mucilage, when freed from that impurity, becomes extremely valuable for lubricating machinery. It is likewise used for lighting ... All domestic cattle thrive upon it, but sheep are rather apt to get blown when fed much upon rape, an effect which, it is said, may be avoided by sprinkling the leaves with salt.... Occasionally Rape is grown for the purpose of manure, being ploughed in after the leaves have nearly attained their full development, but ... this plan can rarely be profitably adopted." He further states that "The cake that remains after the oil is expressed from the seeds is used both for cattle-feeding and as a manure. For the latter purpose it is much employed in Belgium mixed with liquid manure, and is found especially serviceable in the cultivation of flax; it has latterly been adopted in this country, chiefly for the turnip crop, and is largely imported for this purpose."

The principal uses of rape oil are for lubricating oil for machinery, greasing loaves of bread, oiling woolen goods, and for illumination; but after the introduction of mineral oil, the importance of Rape considerably decreased. In Germany it is very considerably used as a salad oil. In the East Indies rape oil and its equivalents are the most important oils for native use, where it is preferred for the preparation of curries and other hot dishes. Rape oil is the subject of extensive adulteration, principally with the cheaper hemp oil, rosin oil, and mineral oils.

In areas where this species has become an undesirable weed, it can be controlled by the same methods as those outlined for *B. kaber*.



Brassica juncea--Chinese Mustard
[From Muenscher (1952), Fig. 41, p. 252.]

Brássica júncea (L.) Coss. Chinese Mustard.

Meaning of Species Name. Rushlike, probably from its slender habit.

Other Names. Leaf Mustard, Brown Mustard, Indian Mustard, Sarepta Mustard.

Type of Plant. An annual or winter annual, reproducing by seeds.

Habitat. Est as a weed in cult fields and waste places.

Range. NS to Sask, s to Va and NM.

Distr in NYS. A frequent weed.

Distr in the Torrey Range. Not uncommon near the larger cities in the range; often wanting.

Time of Fl. Jun-Sep(Oct); Jun-Aug at Cornell.

Origin. Natzd from Eurasia.

Leaf Mustard or Chinese Mustard is grown extensively in the orient and to an increasing extent in the United States as a salad plant or potherb. There are numerous forms and horticultural varieties that produce large, rather upright rosettes of attractive leaves, varying from broad and flat through spatulate to very much curled. This species is adapted to cool seasons and grows well in any good garden soil. The seeds are used in some parts of Europe and Asia as a spice and in cooking, while oil from the seeds is sometimes applied to the body.

In areas where this species has become an undesirable weed, it can be controlled by the same methods as those outlined for B. kaber.

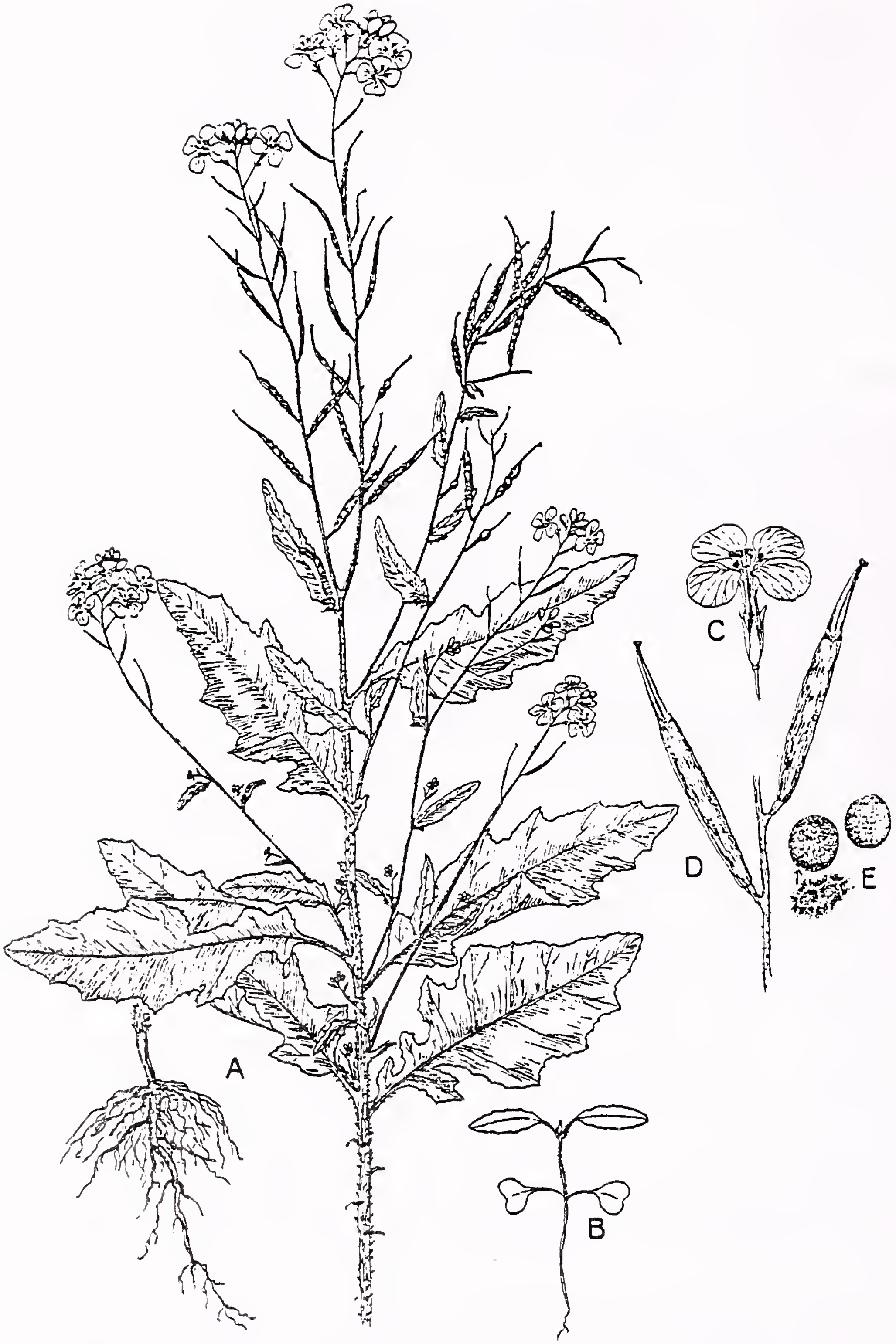
Brássica kàber (DC.) L. C. Wheeler. Charlock.

Meaning of Species Name. Its Persian name.
Other Names. Crunch-weed, Wild Mustard, Corn-mustard, Chadlock, Corn-kale, Field-kale, Kedlock, Kerlock, Curlock, Bastard-rocket, Runchweed, Crowd-weed, Kraut-weed, Yellow-flower, Watercress; Summer Mustard, Field Mustard.
Type of Plant. An annual or biennial herb.
Habitat. Estab as a weed in cult fields, gardens, and waste places.
Range. Throughout the northeastern states, adjacent Canada, and beyond.
Distr in NYS. A common weed in most secs of the state.
Distr in the Torrey Range. Frequent as a weed.
Time of Fl. (May)Jun-Jul(Aug); Jun-Aug at Cornell.
Origin. Natzd from Eurasia.

Charlock can be used as a substitute for Spinach. Sturtevant (1919) reports that in the Hebrides the soft stems and leaves have been boiled in milk for use as a food in times of scarcity. It has also been so employed in Ireland and Sweden. The seeds make a good substitute for mustard, although they are not equal to those of the Black Mustard. According to Grieve (1967) the seeds also "yield a good burning oil, which was much commended by Dodoens, as a preferable substitute for the 'Traine [whale] Oyle.'"

Although it is usually regarded only as a noxious weed, cattle and sheep both like it, so it might make a useful fodder plant. In that case, however, care must be exercised to make certain that farm animals have access only to young plants, for cattle have been poisoned in Canada by consuming the podded plants, while in Great Britain sheep have likewise been poisoned for the same reason. Farmers must also guard against using the seeds of this and other mustards as animal food; in Canada pigs were poisoned when fed ground meal to which the seeds of this plant had been added as an adulterant.

Charlock is a troublesome weed of cultivated fields, particularly in fields of wheat, oats, and barley, for it grows so much faster than these crops that the grain plants are soon smothered out by its heavy foliage. Spencer (1957) states that in California it costs farmers from $2 to $4 an acre to rid their fields of this pernicious weed, and Grieve remarks that in Great Britain it is often so abundant in cultivated fields as to be mistaken at a distance for a legitimate crop. Spencer reported that in California,



Brassica kaber--Charlock
[From USDA Agr. Research Sv. (1971), Fig. 94, p. 193.]

at the time of writing, the best means of destroying this weed seemed to be spraying with a 10 percent (by weight) solution of sulphuric acid, which required special equipment and much work. Better chemical sprays have since been developed, but there is increasing prejudice against the use of chemical sprays because they are likely eventually to contaminate the soil. The first precaution, of course, is to use only seed that is free of weed seeds. If a field does become infested, Muenscher (1952) suggests that "Spring weeding with a harrow on a warm dry day when the wheat [or other crop] is about 4 inches high will destroy most of the mustard seedlings," and later in the season frequent disking or harrowing of stubble fields will induce seed germination. Hand weeding of scattered plants in cultivated crops will also help keep this weed under control.

Brássica nìgra (L.) Koch. Black Mustard.

Meaning of Species Name. Black.
Other Names. Cadlock, Warlock, Scurvy, Senvil, Brown Mustard, Kerlock, Scurvy-senvie.
Type of Plant. An annual or winter annual, reproducing by seeds.
Habitat. Neglected fields, pastures, waste places, streambanks, and ditches, usually in rich soil.
Range. Generally throughout the U.S. and adjacent Canada.
Distr in NYS. A common weed.
Distr in the Torrey Range. Throughout the range except in the pine barrens, there rare or wanting.
Time of Fl. May-Sep, fr Jun-Oct; fl Jun-Oct at Cornell.
Origin. Natzd from Eurasia.

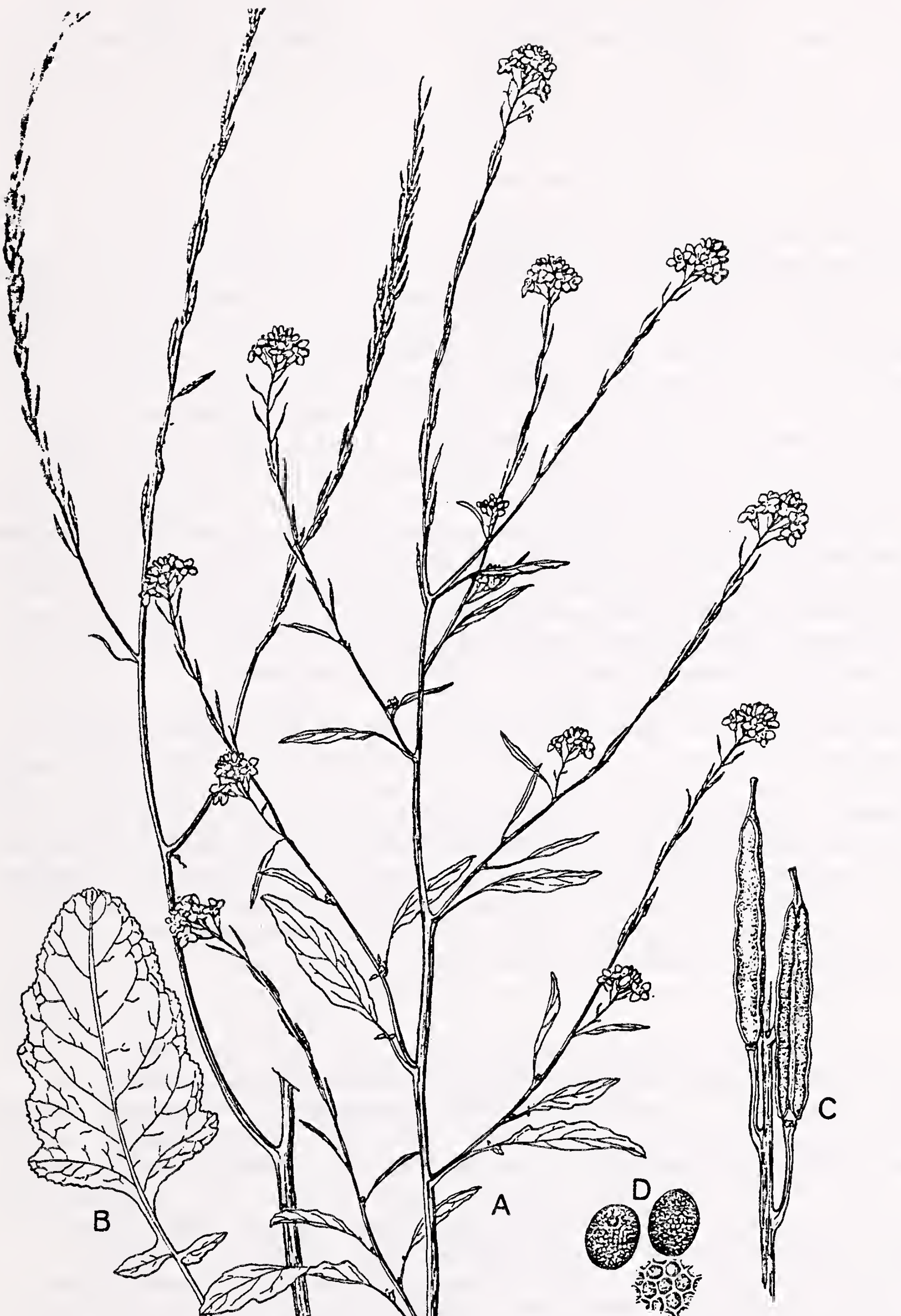
This plant, the mustard of the ancients, is found growing wild practically throughout the continent of Europe, where, according to tradition, it was introduced from Egypt. It was employed in medicine by Hippocrates in 480 B.C. The ancient Greeks held this plant in such esteem as a medicinal plant that they attributed the uses of its seeds to have been revealed to mankind by Aesculapius, the god of medicine. The Greeks and Romans also cooked the young plants as a Spinach in addition to using the seeds as a condiment. It was listed among American garden plants in 1806, and the young leaves are still eaten raw as a salad and cooked as a substitute for Spinach, but they are more pungent than those of White Mustard; in addition, this plant furnishes the seeds from which the greater portion of our table mustard is made, used as a condiment.

When the seeds of this plant were first employed as a condiment is unknown, but the word mustard is a corruption of the Latin mustum, the must of newly fermented grape juice, and ardens, burning. The fruit was called mustard by the ancient Britons during the Roman occupation; the Romans pounded the seeds and steeped them in new wine or "must" in the preparation of the condiment. Gerard in 1623 said that "the seede of Mustard pounded with vinegar is an excellent sauce, good to be eaten with any grosse meates, either fish or flesh, because it doth help digestion, warmeth the stomache and provoketh appetite." Mustard was formerly made up into balls with honey or vinegar and a little cinnamon, to keep until wanted, when it was mixed with more vinegar. It was sold in this form until around 1720, when Mrs. Clements of Durham invented the method of preparing mustard by grinding the seed in a mill and sifting the flour, which long went under the name of Durham mustard. In the United States a thin paste of mustard flour mixed with vinegar and spices is more commonly sold in glass jars for table use than is the dry mustard, though the latter is also available. On this point Johnson (1867) remarks that "When it was first applied as a condiment is unknown, but it was most likely used in England by the Saxons." In addition, both Black and White Mustard "afford an excellent fodder for sheep, and ... are often now used for this purpose after the failure of the turnip or rape crop." He states further that "The Black Mustard is now cultivated in both England and the Continent for the seeds, used partly as a condiment, partly as a source of oil.... [The oil] is applied to various purposes, and is often mixed with rape and colza oil; not being liable to solidify at any ordinary temperature, it is well adapted for lighting purposes.... The cake remaining after the oil has been expressed is sometimes used as a manure; it has been tried for cattle feeding, but is far too acrid."

Six species of Brassica, or wild mustards, are found growing wild in the Catskills, all of which are edible, but perhaps the most popular as a source of "mustard greens" is Black Mustard. Since the leaves growing on the upper part of the flowering stem are exceedingly bitter, it is the lower and basal leaves that should be gathered as a potherb. To be at their best, mustard greens should be gathered early during the first warm weather of spring; at that time they have just the right combination of bitterness and pungency to make a tasty substitute for Spinach. Like Spinach, they tend to shrink during the boiling process, so a sufficient quantity should be gathered to serve your needs. They should be boiled 20 to 30 minutes, then seasoned with butter, salt, pepper, and a little vinegar. A somewhat fancier dish can be made by seasoning with crumbled crisp bacon and finely chopped onion topped with thin slices of hard-boiled egg. Such a dish can be served hot or cold with French dressing or cider vinegar, by many considered a "natural" seasoning for mustard dishes, as it helps to mask some of the bitter flavor, which some relish but to which others object. A few finely chopped mustard leaves will also usually improve the flavor of a tossed green salad. They will likewise improve the flavor of lunch-meat sandwiches, going particularly well with liverwurst. From the standpoint of health, few vegetables surpass mustard greens as a source of vitamins A, B_1, B_2, and C, to say nothing of many of the trace minerals necessary to good nutrition.

In early spring a delicious cream of mustard-leaf soup can be prepared with wild leeks. Melt 2 tablespoons of bacon fat in a frying pan and add 2 or 3 wild leeks, finely chopped. Sauté the leeks over a medium heat until they are slightly brown then add 2 cups of finely shredded mustard leaves and a pinch of salt and pepper. Cook for 5 minutes, then add 1 cup of heated milk, bring to the boiling point, thicken with 1 or 2 tablespoons of flour, and simmer for 2 minutes, stirring constantly. Add the mixture to 3 cups of heated milk in a separate pot and heat just to the boiling point, stirring well. A couple of small onions can be used if wild leeks are not available.

After the leaves become too bitter to eat, it is still possible to reap a rich harvest from these plants, for as the weather warms up the flower buds start to form. These buds, a source of "wild broccoli," can be gathered over quite a long season, from the time they first form until



Brassica nigra--Black Mustard
[From USDA Agr. Research Sv. (1971), Fig. 95, p. 195.]

nearly all the flowers open. These buds should be boiled in salted water for only 3 minutes, otherwise they form an unsightly, mushy mess. Then drain and season with butter, chopped onion, and a little vinegar. The taste is reminiscent of cultivated broccoli, but it has a pungent flaver all its own. The flower buds contain even more vitamin A than the leafy greens in addition to furnishing considerably more protein because of the developing nitrogenous pollen.

In due time the yellow flowers are followed by small four-sided seed pods about half an inch long, each containing several seeds from which the well-known commercial condiment is prepared. It is something of a task, but it is possible to prepare your own ground mustard by gathering the flowering tops before the seeds drop out, spreading them out on a large plastic sheet to dry in the sun for a few days, then beating out the seeds with a flail, and winnowing them on a windy day. By using the fine plate, the clean dry seeds can be ground in an ordinary food chopper and the powder sifted through a fine sieve. This is the same dry ground mustard found on the grocer's shelves and can be used in the same way. To make the yellow pasty condiment called prepared mustard, put some wheat flour in a pan and toast it in the oven, stirring occasionally until it is evenly browned; this will prevent the prepared mustard from having a raw, starchy taste. This browned flour is mixed, half and half, with the ground mustard flour moistened to the right consistency with a mixture of half vinegar and half water. The amounts of mustard and flour can be varied to suit your own taste, but you are certain to come up with something far superior to much of the anemic commercially prepared mustard available at the supermarket.

The seeds of both the White and Black Mustard have been used in medicine since ancient times as an irritant, stimulant, diuretic, and emetic. Internally, mustard was found useful as a regulator and mild aperient, being at the same time an alterative. A tablespoonful of mustard flour added to a glass of warm water operates as an efficient emetic, acting directly on the gastric sensory nerves, but it should be used only for emergency treatment of poisoning. In smaller doses the crushed seeds were considered a safe stimulant of the digestive system, beneficial in the treatment of dropsy. Used internally, mustard stimulates the salivary glands but not the gastric secretions, although it increases the peristaltic movements of the stomach.

The powdered seeds of Black Mustard have also had long medicinal use as a rubefacient in the form of the familiar mustard plaster, used as a powerful counterirritant, by many still considered one of the finest remedies for a congested chest resulting from a cold. Mustard plasters were much employed in the treatment of pneumonia, bronchitis, and other diseases of the respiratory organs. They were also used to apply heat to sore muscles and aching backs as well as to relieve neuralgia and rheumatic pains. To prepare a mustard plaster, ground mustard, mixed half and half with wheat flour, was moistened with tepid water to the consistency of paste, spread thinly on a piece of muslin, covered with another piece of cloth, and applied to the affected part. It was left on for 20 minutes or so, or until the skin became red, the sensation of heat continuing to increase as long as the plaster was left on. It was therefore necessary to exercise caution in the use of mustard plaster, for too long an application blistered the skin and sometimes resulted in "obstinate ulceration." In Johnson's time (1867) "A mustard plaster so made" was considered to be "the safest and best domestic application in most cases of internal inflammation, and in many instances, its early use will avoid more serious disorders ..."

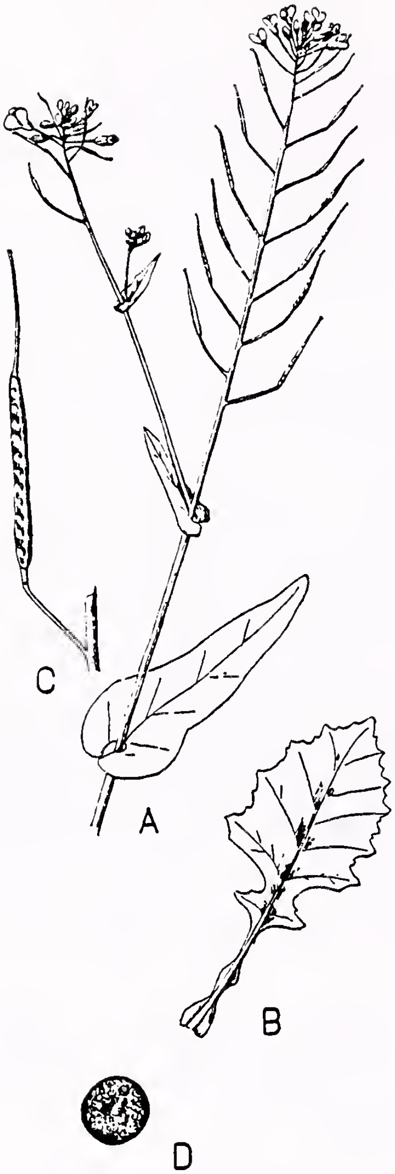
Some Indian tribes learned of the medicinal uses of Black Mustard from the colonists, for the Mohegans are reported to have used the leaves to relieve toothache and headache by binding them to the skin, while the Meskwakis ground up the seeds for use as a snuff to cure a head cold.

The volatile oil distilled from Black Mustard seeds after maceration with water is official in the British pharmacopeia under the title Oleum sinapis volatile; in the United States it is known as Sinapis nigra. Oil of mustard is a powerful irritant and rubefacient; when applied to the skin in its pure state, it produces almost instant vesication, but when dissolved in rectified spirit or spirit of camphor, or employed in the form of the compound liniment of mustard of the British pharmacopeia, it is considered a useful application in the treatment of chronic rheumatism, colic, and chillblains. Hot water poured on bruised Black Mustard seeds makes a stimulating foot bath and was considered to help in throwing off a cold or dispel a headache. It also acts as an excellent fomentation. The bland oil expressed from the hulls of the seeds, after the flour has been sifted out, is said to promote the growth of hair and may be used with benefit externally in the treatment of rheumatism. Oil from the seeds has also been used in making soap. Whitehead's Essence of Mustard is made with spirits of turpentine and rosemary, with which camphor and the farina of Black Mustard seed are mixed. This oil is very little affected by frost or the atmosphere and is therefore especially prized by clockmakers and makers of instruments of precision.

The seeds must be considered potentially toxic to livestock. In Denmark mustard-seed cake from B. juncea, a related species, caused mortality in several herds of milking cattle. In areas where this species has become an undesirable weed, it can be controlled by the same methods as those outlined for B. kaber.

Brássica ràpa L. Turnip.

Meaning of Species Name. An old generic name.
Synonyms. B. napus in Fernald (1950).
Other Names. Bees' Rape.
Type of Plant. A biennial herb, the flowering stems arising from a thick root.
Habitat. Cult fields and waste places.
Range. Commonly cult; often persistent through the winter and flowering the following spring.
Distr in NYS. Wild forms of the cult Turnip are not infrequent as weeds in cult or waste ground.
Distr in the Torrey Range. Sometimes found as weeds in the area.
Time of Fl. Early summer.
Origin. Introd from Eurasia.
Remarks. Rarely winters over and probably never fully estab.



Brassica rapa--Turnip
[From Muenscher (1952), Fig. 43, p. 256.]

Krochmal (1973) states that during the 1920's the ground seeds of this plant were used to prepare the familiar "mustard plaster" applied to the chest in the treatment of "colds, fever and flu." They were also sometimes used "to induce vomiting, as an aid to digestion, and as a laxative," but for these purposes they have been replaced by far more effective and less dangerous preparations.

Camelina Crantz. False Flax.

There are about 10 species of Camelina, erect herbs with sagittate-clasping leaves, natives of central Europe and western Asia. The name of the genus is derived from the Greek chamai, dwarf, and linon, flax. Camelina sativa occurs in northeastern North America as a noxious weed in flax fields, having been introduced from Europe. It was regularly cultivated in medieval Germany and Russia and is still cultivated in Flanders. The stem yields a fiber, but the stalks seem to be used only in broom-making. The seeds yield an oil which has been used for culinary and other purposes. It was called Gold-of-pleasure in Great Britain even in the time of Gerarde. The seeds are sometimes imported into England under the name of dodder seed, but they have no relation to the true dodder, which belongs to an entirely different family. Of Camelina sativa, Johnson (1867) wrote that it "has been long cultivated in Germany and France, for the sake of oil expressed from its seeds ... The oil ... is used in Central Europe for a variety of domestic purposes, but is liable to become rancid by keeping.... It is chiefly consumed by soap makers.

"After the oil is pressed out, a cake remains, capable of being employed as food for cattle, but much difference of opinion exists as to its fitness for that purpose.... but it contains much oily, and other nutritious matter, and, as far as mere nutriment is concerned, is certainly equal to that of the poppy, though probably inferior to linseed cake.

"The plant is sometimes grown as green fodder for sheep, and the crop, when sown early, may always be fed off in this way, and afterwards allowed to run to seed....

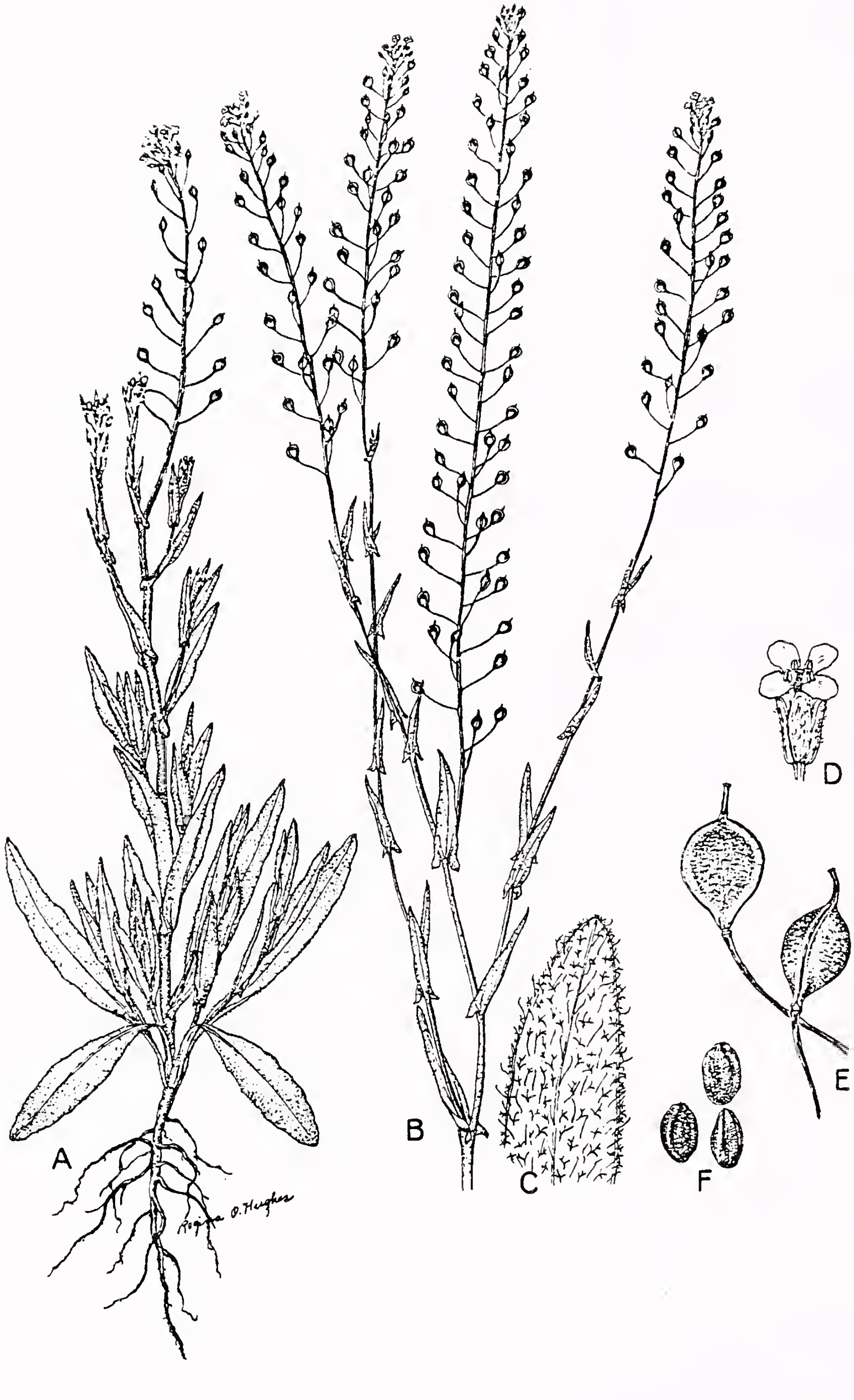
"The seeds are liked by birds, especially those of the finch and bunting tribe ... Domestic poultry, and particularly geese, are very fond of the seeds, and fatten quickly upon them."

The name "Gold-of-Pleasure" is said to bear ironical reference to the disappointment of its first cultivators in Great Britain, who found their investment in it about as profitable as gold squandered on "pleasure" usually proves.

Camelìna microcárpa Andrz. Small-seeded False Flax.

Meaning of Species Name. Small-fruited.
Other Names. False Flax, Dutch Flax, Western Flax, Siberian Oil Seed.
Type of Plant. An annual herb, reproducing by seeds.
Habitat. Grain fields, flax fields, roadsides, and waste places.
Range. Nf to BC, s to Va, Tenn, Mo, Tex, etc.
Distr in NYS. Infrequent about the larger cities and towns across the state.
Distr in the Torrey Range. Not common as a weed in most parts of our range.
Time of Fl. Apr-Sep; May 10-Jun 20 at Cornell.
Origin. Introd and natzd from Eu.

House (1924) states that "Several recent collections seem to indicate that it is of recent introduction and increasing rapidly." It has been collected only once in Delaware County as a waif on disturbed soil where a new road was being built; it did not persist in that area and could not subsequently be located there.



Camelina microcarpa--Small-seeded False Flax
[From USDA Agr. Research Sv. (1971), Fig. 96, p. 197.]

Capsélla Medic. Shepherd's-purse.

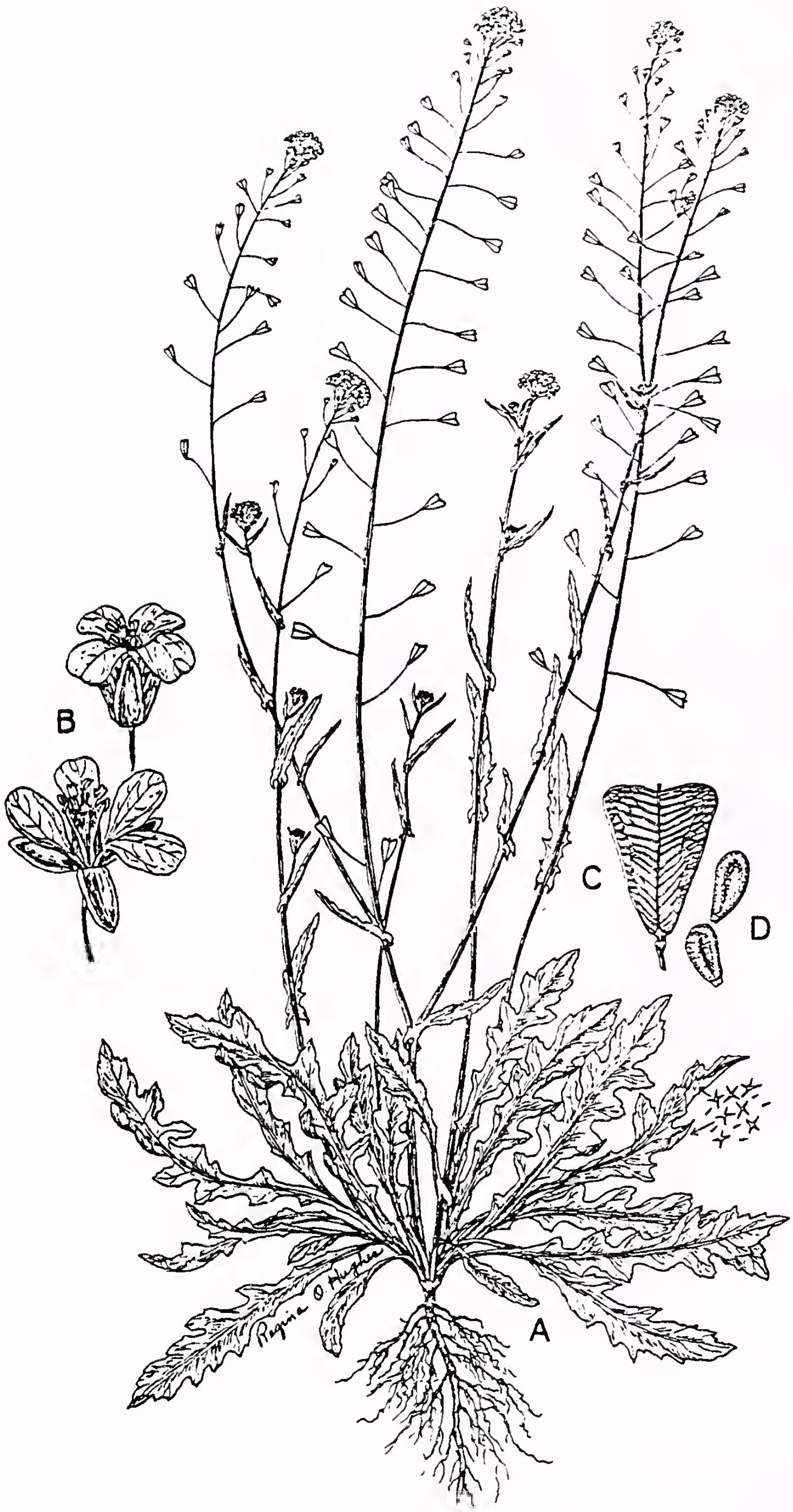
There are at least five species of *Capsella*, natives of southern and eastern Europe. The name of the genus is derived from the Latin *capsella*, a little box, alluding to the fruit. They are annuals or winter annuals with rosulate leaves and small white or pink flowers.

Capsélla búrsa-pastòris (L.) Medic. Shepherd's-purse.

Meaning of Species Name. Shepherd's-pouch; *Bursa* is an old generic name.
Other Names. Pick-pocket, Shepherd's-bag, Pepper-plant, Case-weed, Blind-weed, Pick-purse, Lady's-purse, Rattle-pouches, Witches'-pouches, Shovel-weed, Wind-flower, Toothwort, Pepper-and-salt, Mother's-heart.
Type of Plant. An annual or winter annual, reproducing by seeds.
Habitat. A weed of lawns, gardens, roadsides, cult ground, and waste places.
Range. Throughout the northeastern states, adjacent Canada, and beyond.
Distr in NYS. Very common.
Distr in the Torrey Range. Common everywhere.
Time of Fl. Mar-Dec; Mar-Dec at Cornell.
Origin. Natzd from Eu.
Remarks. Probably native originally in s Eu, now a cosmopolitan weed.

This common weed has accompanied Europeans in all their navigations and migrations to establish itself wherever they have settled to cultivate the soil. The vigorously growing rosettes of these plants are sometimes cooked like spinach and, although its turnip-like odor and flavor are disagreeable to some, it is relished by many people. There are two reports of its actually having been cultivated near Philadelphia in the early 1800's. In 1818 Barton, writing from Philadelphia, stated that "The young radical leaves are brought to market and sold for greens, in the spring of the year." Correa de Serra gave more elaborate details when he wrote to the Horticultural Society of London in 1821: "The *Capsella bursa pastoris*, or common Shepherd's purse ... is an esculent plant in Philadelphia, brought to market in large quantities in the early season. The taste, when boiled, approaches that of Cabbage, but is softer and milder. This plant varies wonderfully in size and succulence of leaves, according to the nature and state of the soil where it is grown. Those from the gardens and highly cultivated spots near Philadelphia come to a size and succulence of leaf scarcely to be believed without seeing them. They may be easily bleached by the common method, and certainly in that state would be a valuable addition to the list of delicate culinary vegetables."

By 1837, however, Darlington, a botanist writing from neighboring West Chester with special emphasis on "domestic and rural economy" did not seem to be aware of this unusual plant of the Philadelphia market, for he described it as "a worthless little intruder from Europe," as most people have regarded it ever since. From these facts Sturtevant (1919) concluded that "the statement of its culture is one of the errors which are copied from book to book." Be that as it may, it has in the past been much collected by the poor in China as a food plant. The writer also has prepared this plant



Capsella bursa-pastoris--Shepherd's-purse .
[From USDA Agr. Research Sv. (1971), Fig. 97, p. 199.]

as a potherb and can report that he has not only collected some quite sizeable rosettes but that when boiled 10 or 15 minutes in salted water and served with butter, salt, pepper, and vinegar, they make a very agreeable substitute for Spinach. This European weed seems also to have an additional use as a food plant, for Chestnut reported that California Indians sometimes gathered the seeds and ground them into meal.

The odor of this species has been described as "peculiar and rather unpleasant, though more cresslike than pungent." It has an aromatic and biting taste in the raw state but is less acrid than most of the Crucifers. It causes taint of milk when freely consumed by dairy cattle.

Shepherd's-purse has been much used in English domestic medicine from early times as an astringent, one authority stating that "when dried and infused, it yields a tea that is ... considered by herbalists one of the best specifics for stopping hemorrhages of all kinds, of the stomach, the lungs or the uterus and more especially bleeding from the kidneys." Its medical properties were considered equal to those of ergot and hydrastis, and during World War I, when these were no longer obtainable in Germany, a liquid extract of Capsella was used as a substitute. At least one physician found the herb "of prompt use in arresting bleedings" when given in the form of a fluid extract in doses of 1 or 2 spoonfuls. From early times it was also used in English domestic practice as an astringent in diarrhea, and in veterinary practice it was much used in decoction with milk to check active purgings in calves. The fresh juice was likewise applied locally as a vulnerary in nose-bleeding, which was checked by moistening a ball of cotton with the juice and inserting it into the nostrils. Its antiscorbutic, stimulant, and diuretic action also recommended it for use in the treatment of kidney complaints, dropsy, dysentery, "catarrhal conditions of the bladder," and "various passive hemorrhages from mucous surfaces," as well as for uterine cramp and colic. Later, according to the U.S. Dispensatory of 1865, "its value here was much doubted, and other properties accorded it, especially those of a stimulating astringent and diuretic." The fresh herb, bruised, has also been employed as a topical application in rheumatic affections. Since this was not a native plant, any medicinal use made of it by the Indians must have been learned from the whites. Densmore (1928) reports that the Chippewas prepared a decoction of the entire plant for use in the treatment of dysentery, one of the uses made of it in European medicine.

Small birds are fond of the seeds of this species, and poultry are said to relish the young leaves.

In areas where this species has become an obnoxious weed, clean cultivation begun early and continued late into summer will help to bring it under control. Muenscher (1952) also suggests that hand hoeing and weeding in gardens and small areas is also effective, adding that "Badly infested fields should be harrowed several times after the crop is removed. Infested grain fields should be harrowed while the grain is from 3 to 6 inches high."

Cardámine L. Bitter Cress.

There are more than 130 species of *Cardamine* in the temperate zones of both hemispheres. The name of the genus is derived from an ancient Greek name, *kardamon*, used by Dioscorides for some plant of the Mustard family. They are mostly glabrous annual or perennial herbaceous plants of cold and temperate regions, leafy stemmed, often growing along watercourses and in wet places. This treatment, following Schwarz (1939) and Wood (1870), includes two species which both Fernald (1950) and Gleason (1952) have placed in the genus *Dentaria*--*C. concatenata* and *C. diphylla*.

Many of the bitter cresses have long served as food plants. *C. amara*, a native of Europe and northern Asia with acrid and bitter leaves, has often been used in salads by country people, their taste, as reported by Johnson (1867), "although pungent and bitter, is not unpleasant." *C. glacialis*, which Captain Cook found growing in abundance in damp places about the Strait of Magellan, was used as an antiscorbutic. *C. hirsuta*, the "scurvy grass of Tierra del Fuego" also grows in Scotland, where the leaves and flowers are used to "form an agreeable salad." *C. nasturtioides*, a native of Chile, and *C. sarmentosa*, a native of New Caledonia, are both "eaten as a cress," while the leaves of *C. rotundifolia*, Mountain Watercress, a plant of springy places and brooksides in the mountains of the northeastern states, "have just the taste of the English watercress."

Key to the Catskill Species of *Cardamine*

1. Leaves palmately divided or cleft into 3 or more leaflets or segments; rhizome fleshy, toothed or jointed, 2

2. Rhizome long and continuous, prominently toothed, not breaking up into separate segments; leaflets ovate, coarsely toothed; inflorescence glabrous; cauline leaves mostly 2, subopposite .... *C. diphylla*

2. Rhizome breaking up into a series of spindle-shaped tubers; cauline leaves usually 3, whorled or nearly so; leaflets oblong-linear, conspicuously incised-toothed or laciniate; inflorescence puberulent.................................. *C. concatenata*

1. Leaves simple, pinnatifid, or pinnate, not palmately divided, 3

3. Leaves simple and undivided; tuberous-based upright perennials with flowers 0.7-2 cm long (stem more or less hirsute; cauline leaves 2-5(6), all sessile or 1 or 2 of the lowest with petioles; petals rose-purple or pink-tinged)........ *C. douglasii*

3. Leaves pinnate or pinnatifid; plants fibrous-rooted; flowers mostly 1.5-15 mm long, pedicelled, 4

4. Flowers large, with petals 1-1.5 cm long; perennial (leaves pinnate, with numerous leaflets or segments, the terminal leaflet of the cauline leaves much narrower; petioles not dilated at base)...................................... *C. pratensis*

4. Flowers small, with petals 1.5-4 mm long; plants annuals or biennials with overwintering rosettes, or short-lived perennials, 5

5. Lateral leaflets of the cauline leaves commonly oval or oblong and decurrent on the rachis; stems (except in submersed bases) hispid or hispidulous at base; terminal leaflet of cauline leaves usually broader than lateral leaflets.................................... *C. pensylvanica*

5. Lateral leaflets of the cauline leaves commonly linear, quite distinct, not decurrent along the rachis; stems glabrous throughout; terminal leaflet of cauline leaves scarcely broader than lateral leaflets........................ *C. parviflora*

Cardámine concatenàta (Michx.) O. Schwarz. Pepper-root.

Meaning of Species Name. Like a chain, alluding to the constricted rhizome.

Synonyms. *Dentaria lacinata* Muhl. in Fernald (1950) and in Gleason (1952).

Other Names. Cut-leaved Toothwort, Purple-flowered Toothwort, Crowfoot, Crow-toes, Cut-leaved Pepper-root.

Type of Plant. A perennial herb.

Habitat. Moist rich woods, wooded bottoms, and calcareous rocky banks.

Range. Que to Minn and Neb, s to Fla, Ala, La, Ark, and Kan.

Distr in NYS. Frequent or common across the state but rare or absent from the greater part of the Adirondack reg and infrequent or rare on LI.

Distr in the Torrey Range. Throughout the range except in the pine barrens and s of them, there rare or wanting.

Time of Fl. (Mar)Apr-May; Apr 20-May 20 at Cornell.

Origin. Native.

The rootstocks of this member of the Mustard family will furnish the hiker with a pleasant nibble as well as make an excellent accompaniment for his sandwiches. Grated and mixed with a little vinegar, it also makes a very acceptable camp horseradish to accompany fish and stews. *Cardamine diphylla* can be used in the same way, but it is not so pungent as this species. This is a rare plant in the Catskills, however, and every effort should be made to protect any stations that may be found.

Cardámine diphýlla (Michx.) Wood. Crinkleroot.

Meaning of Species Name. Two-leaved.

Synonyms. *Dentaria diphylla* Michx. in Fernald (1950) and in Gleason (1952).

Other Names. Two-leaved Toothwort, Trickle, Two-leaved Pepper-root.

Type of Plant. A perennial herb.

Habitat. Rich woods.

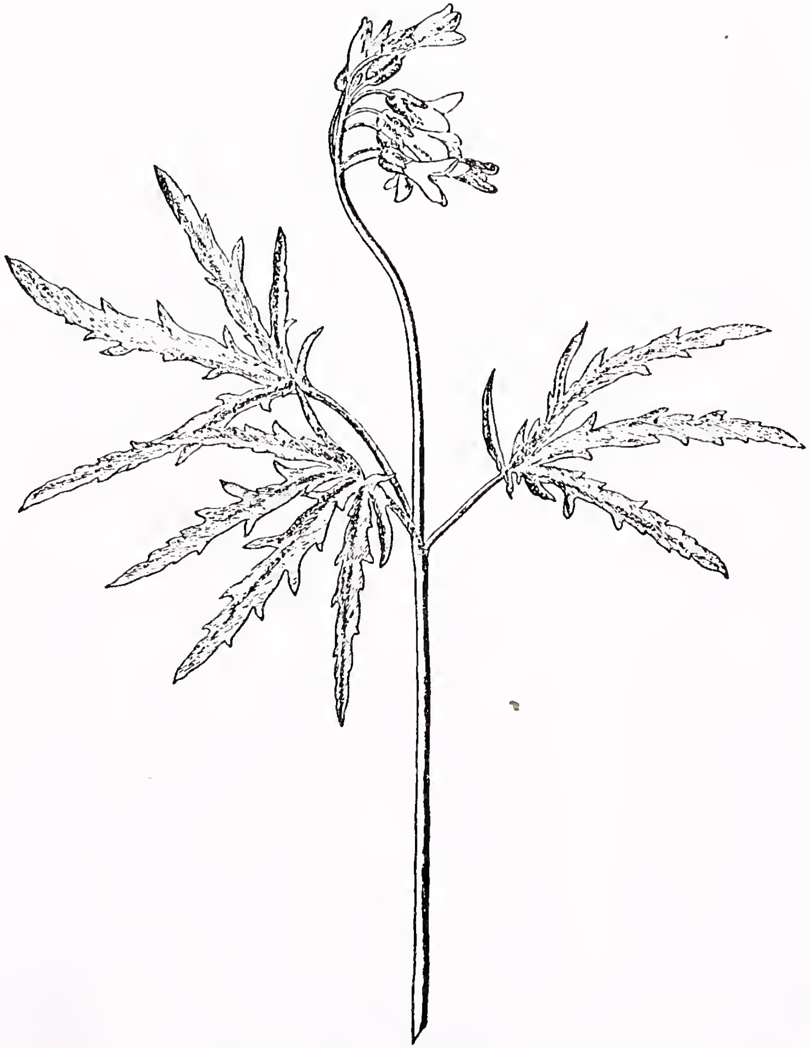
Range. Gaspe Pen, Que, and NB to Minn, s to Pa, SC, Ky, O, Ind, and Mich; in the mts s to Ga and Ala.

Distr in NYS. Frequent or common throughout most secs of the state outside the sandy coastal plain.

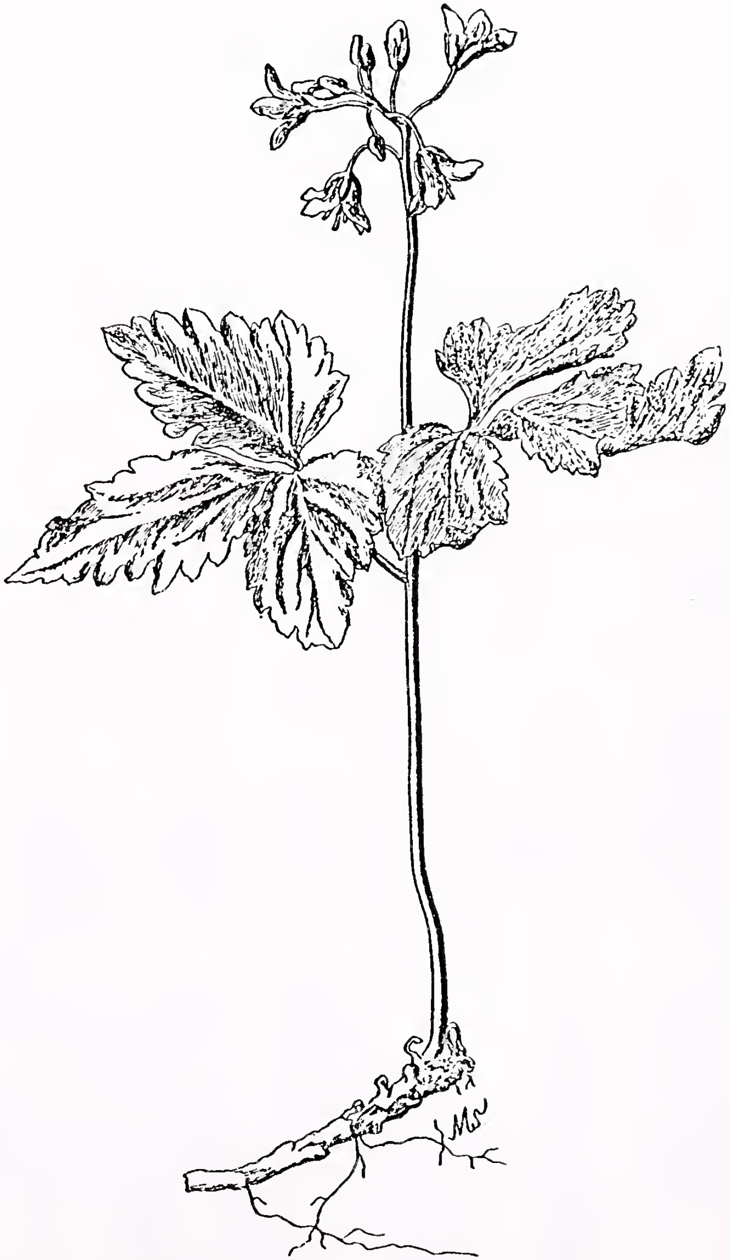
Distr in the Torrey Range. Throughout the area except in the pine barrens of LI and c and s NJ, there rare or wanting; always increasing northw. Formerly on SI.

Time of Fl. Mid-Apr-May(early Jun); May 1-20 at Cornell.

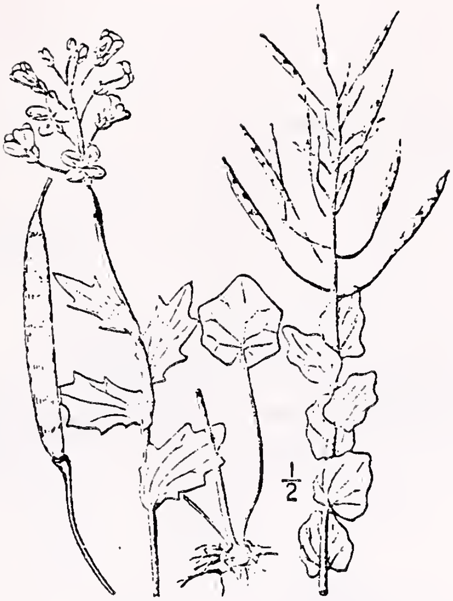
Origin. Native.



Cardamine concatenata--Pepper-root
[From Dana (1900), Plate 5, p. 12.]



Cardamine diphylla--Crinkleroot
[From Dana (1900), Plate 4, p. 10.]



Cardamine douglasii--Purple Cress
[From Britton & Brown (1913), Vol. II, p. 186.]

The long, crisp, white rootstock of this species is a popular nibble with children and makes a palatable ingredient in salads or a pleasant radish-like relish when eaten with salt. The taste has been described as "like water cress," but it is much more pungent. Pursh described the taste as "mustard-like" and stated that the rootstocks were "used by the natives as mustard"; by this he presumably meant that the American Indians used the plant as a sort of relish. It is sometimes planted in the wildflower garden in partially shaded areas.

Cardámine douglàsii (Torr.) Britt. Purple Cress.

Meaning of Species Name. Named for its discoverer, David Bates Douglas, 1790-1849.

Other Names. Mountain Watercress.

Type of Plant. A perennial herb.

Habitat. Moist woods, calcareous springy places, and bottomlands.

Range. Ct, Ont, and NY to Wis, s to Va, Tenn, Ky, and Mo.

Distr in NYS. Infrequent or rare in the n, c, and w parts of the state; rare and local in the Hudson valley from Westchester co northw; common around Rochester and in Tompkins co.

Distr in the Torrey Range. Under C. purpurea (Torr.) Britt.--NY: Rare and local in the Hudson valley from Westchester co northw, but not reported from the region of the Catskills.

Elevation. Sea level-1000 ft in the Torrey range; collected at 1680 ft in Delaware co.

Time of Fl. Mid-Mar-Mid-May; Apr 20-May 15 at Cornell.

Origin. Native.

Remarks. Flowers 10-15 days earlier than C. bulbosa; more abundant northw.

Cardámine parviflòra L. Small-flowered Cress.

Meaning of Species Name. Small-flowered.
Other Names. Sand Bitter-cress.
Type of Plant. An annual or biennial herb.
Habitat. Dry woods, shaded or exposed ledges, and sandy soils.
Range. NS, NB, Me, and Que to Ont, Wis, and Minn, s to Ga, Ark, and Tex; BC to Ore; also in Eurasia.
Distr in NYS. Local on LI and SI, occasional in the Bronx and in Westchester co, increasing but not common northw.
Distr in the Torrey Range. NY: Occasional on the coastal plain of LI, on SI, in the Bronx, and Westchester co, thence increasing northw.
Elevation. Sea level-2100 ft in the Torrey range.
Time of Fl. Apr-Aug; Jun at Cornell.
Origin. Native.

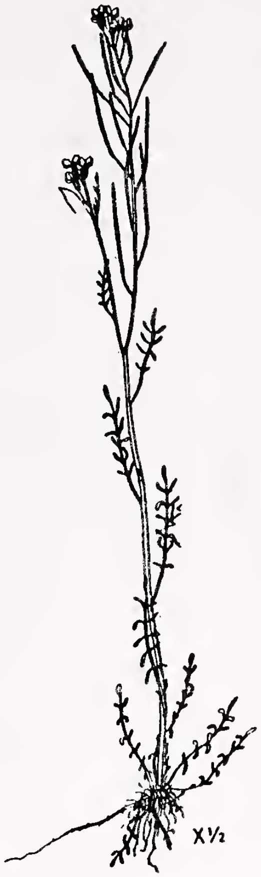
Cardámine pensylvánica Muhl. Pennsylvania Cress.

Meaning of Species Name. Of Pennsylvania.
Other Names. Pennsylvania Bitter Cress.
Type of Plant. A biennial or short-lived perennial.
Habitat. Springs, rills, swamps, and wet woods.
Range. Lab, Nf, and Que to Minn and BC, s to Fla, Ala, Ark, Tex, and Cal.
Distr in NYS. Frequent or common throughout the state.
Distr in the Torrey Range. Common throughout the area except in the pine barrens, there rare or wanting.
Time of Fl. (Mar)Apr-Jun(Dec); May-Jul at Cornell; occasionally Oct in the Catskills.
Origin. Native.
Remarks. Our commonest species.

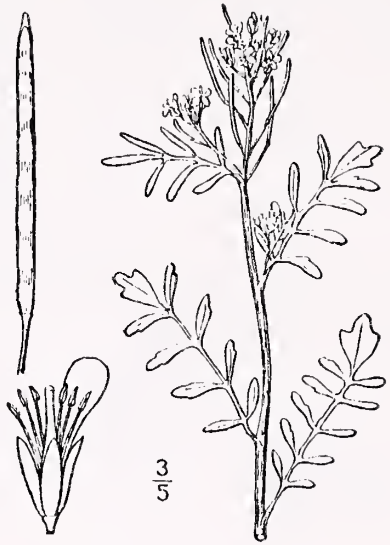
This native plant so closely resembles commercial Watercress that by many people it is not readily distinguished from it, and it makes almost as good a salad or ingredient of a salad. The stems and leaves, however, are less tender and succulent. It is a wise practice to disinfect the plants before eating them raw.

Cardámine praténsis L. Cuckoo-flower.

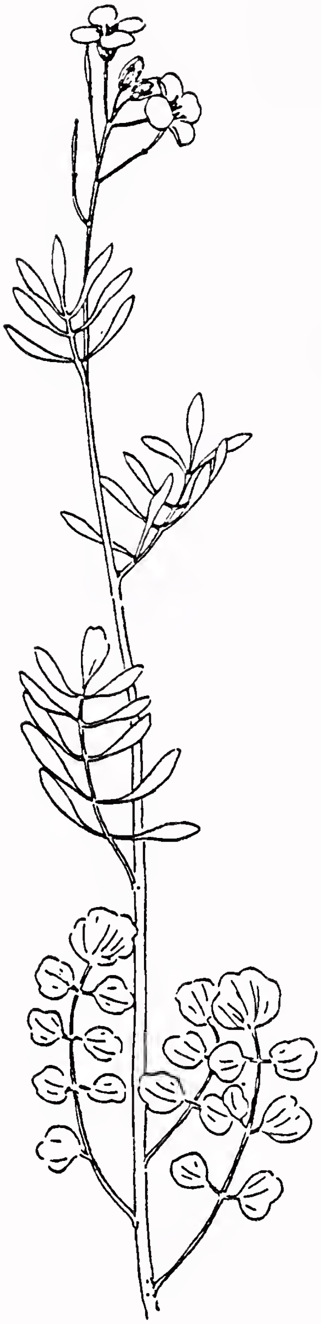
Meaning of Species Name. Of meadows.
Other Names. Lady's-smock, Meadow Bitter-cress, Cuckoo-spit, Smick-smock, Milkmaid, Spink, May-flower.
Type of Plant. A perennial herb, reproducing by seeds and short rootstocks.
Habitat. Moist soil of lawns, roadsides, low meadows, and pastures.
Range. Nf to O, s to NJ and Pa.
Distr in NYS. Reported as adv or natzd locally in NYS, appearing chiefly in lawns and yards.
Distr in the Torrey Range. NY: Pine Plains, Dutchess co; also on lawns at Riverdale and at Garden City; a rare and local plant in our area, becoming frequent in the far n.



Cardamine parviflora--Small-flowered Cress
[From Gleason (1952), Vol. II, p. 231.]



Cardamine pensylvanica--Pennsylvania Cress
[From Britton & Brown (1913), Vol. II, p. 184.]



Cardamine pratensis--Cuckoo-flower
[From Smith (1966), Plate 70, p. 160.]

Time of Fl. (Apr)May-Jun(Jul); May 15-Jun 10 at Cornell.
Origin. Natzd from Eu; quite abundant in the Margaretville and Downsville areas, where it has presumably esc from cult.

Sturtevant (1919) describes this species as "an insignificant and nearly worthless salad plant, native to the whole of Europe, northern Asia, and Arctic America." Nevertheless, it has a piquant flavor and makes a useful substitute for Watercress. It is recorded as having been cultivated in the vegetable gardens of France in 1829, but it seems not to have been cultivated in England. It has become naturalized to a limited extent in America, "a fact which implies a certain cultivation, but its seed was not [at least in 1918] offered in our catalogs." In Europe the bitterish and somewhat pungent leaves are sometimes added to salads.

According to the U.S. Dispensatory of 1865, the flowers "formerly possessed the reputation of being diuretic," implying that they were then no longer employed for that purpose, but at that time they were "occasionally used as an antispasmodic in various nervous diseases, such as chorea and spasmodic asthma, in which they were successfully employed." The editors of that volume, however, concluded that "They produce ... little obvious effect upon the system and are not employed in this country." Johnson (1867) remarks that "The juice of the Lady's Smock is much employed in Sweden as a remedy for scorbutic disorders, and the leaves are often eaten as salad, both there and in Germany, where ... they are sold in large quantities in the markets ... Cattle generally appear to avoid the Lady's Smock, but both cows and sheep will occasionally crop the leaves ..."

The variety florepleno bears large double lilac flowers on stems 12 to 18 inches high in May and June and is the kind chiefly worth growing in the garden. These plants thrive in ordinary soil, preferring that which is damp, and they will flourish in shady places.

In areas where this species may have become an undesirable weed, Muenscher (1952) suggests that improved drainage in meadows will help to bring it under control. Plow and cultivate for a year when possible; it should be hoed out in lawns and the bare patches reseeded.

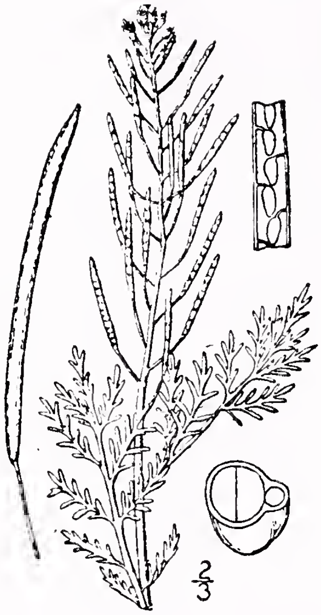
Descurània Webb. & Berth. Tansy-mustard.

There are about 40 species of Descurania, chiefly native in the temperate zone of the northern hemisphere. The name of the genus commemorates François Descurain, 1658-1740, a French apothecary and botanist. They are annual or biennial herbs of America and Europe with divided leaves, the basal rosette usually having withered at flowering time.

Kingsbury (1964) reports that cases of poisoning from ingestion of D. pinnata have occurred in cattle on range in the southwest, but "A diet consisting almost entirely of this plant is required." It is particularly dangerous during the blooming period and until the seed pods have matured, after which the plants become rough and fibrous. Cattle will readily eat this species "in quantity," particularly if other forage is scarce.

Descurània sòphia (L.) Webb. Tansy-mustard.

Meaning of Species Name. An old generic name.
Other Names. Herb-sophia, Flixweed, Fine-leaved Hedge-mustard, Flaxweed.
Type of Plant. An annual herb, reproducing by seeds.
Habitat. Fields, roadsides, and waste places.
Range. Que to Wash, s to Del, Pa, Kan, Mo, Col, Utah, and Cal.
Distr in NYS. Infrequent.



Descurania sophia--Tansy-mustard
[From Britton & Brown (1913), Vol. II, p. 170.]

Distr in the Torrey Range. Occasional as a weed in most parts of our range except in the pine barrens.
Time of Fl. Late May-Jul(Aug).
Origin. Natzd from Eu.
Remarks. Locally abundant eastw; more common w of Gray's Manual range.

This plant is sometimes called Flixweed, or Fluxweed, from having been prescribed in cases of dysentery. It was called by the old herbalists Sophia Chirugorum, "The Wisdom of Surgeons," on account of its vulnerary properties. The juice, mixed with an equal quantity of honey or vinegar, has been recommended for chronic coughs, hoarseness, and ulcerated throats. A strong infusion of the herb has proved excellent in asthma, and the seeds formed a special remedy for sciatica. Combined with Vervain, it is supposed to have been Count Mattaei's famous remedy, Febrifugo.

Martin et al. (1951) report that the small seeds of this species are relished by western quail, "sometimes pods and all" and that "the plants are utilized by other wildlife," but they are found so infrequently in the Catskills that its use to wildlife in that area is almost nil.

In areas where this species has become an undesirable weed, it can be controlled by the same methods as those outlined for Sisymbrium altissimum.

Johnson (1867) remarks that "In more recent times it has been recommended in hysterical cases, but its useful qualities in this respect require further proof. Its seeds ... were sometimes given to children to destroy worms."

Erysimum L. Wormseed-mustard.

There are about 80 species of Erysimum, natives chiefly of eastern Europe, central and western Asia, and northern Africa; several species also occur in the western states. The name of the genus is by some derived from the Greek erusimon, applied originally to some cultivated plant; other authorities consider the name to have been derived from the Greek eryomai, help or save, from the supposed medicinal properties of some species; still others derive the name from the Greek eryo, to draw, referring to the plants' supposed properties of producing blisters. They are chiefly biennial spring- and summer-flowering plants mostly with yellow flowers and with leaves not clasping. The pubescence consists of appressed 2-3-parted hairs.

These plants grow 12 to 18 inches high and resemble miniature wallflowers, from which they differ principally in the size and formation of the seed pods. The hardy annual E. perofskianum is a favorite plant for spring flower beds. E. asperum and its varieties are generally grown as biennials from seeds sown in summer to provide flowering plants the following year. The plants grown in gardens as Siberian Wallflowers and generally named Cheiranthus allionii are believed to be horticultural varieties of E. asperum.

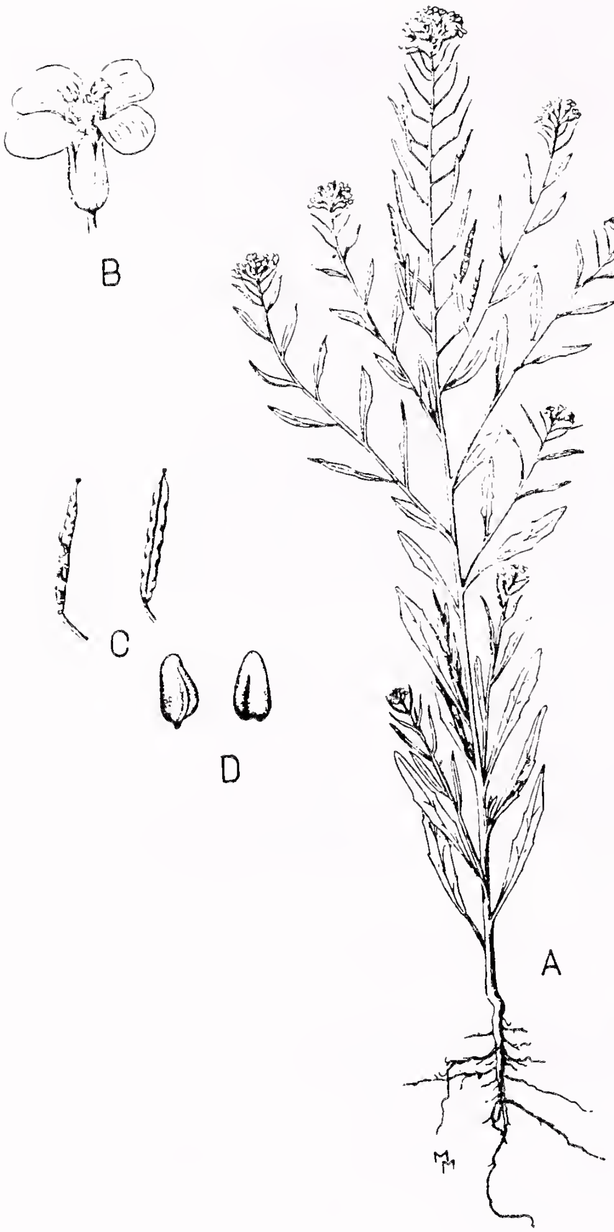
Key to Local Species of Erysimum

1. Sepals 2-3.5 mm long; petals 3.5-5.5 mm long; fruits ascending to erect, 1.2-2.5 cm long............................... E. cheiranthoides
1. Sepals 4.5-7 mm long; petals 6-10 mm long; fruits widely spreading, 5-12 cm long... E. repandum

Erysimum cheiranthoides L. Wormseed-mustard.

Meaning of Species Name. Resembling Cheiranthus, Wallflower.
Other Names. Treacle-mustard, Tarrify.
Type of Plant. An annual or winter annual, reproducing by seeds.
Habitat. Usually in wet soil but also appearing as a weed in cult fields, gardens, rich meadows, roadsides, and waste places, often on gravelly or sandy soils.
Range. Nf to BC and Ak, s to NC, Tenn, Ark, Col, and Ore; widely distr in Eurasia.
Distr in NYS. Frequent or common in most secs of the state outside the higher Adirondacks.
Distr in the Torrey Range. Occasional throughout our range except in the pine barrens, nearly always as a weed.
Time of Fl. Jun-Aug(Sep); Jun-Sep at Cornell.
Origin. Natzd from the old world.
Remarks. House (1924) states that it is "Native but appearing adventive."

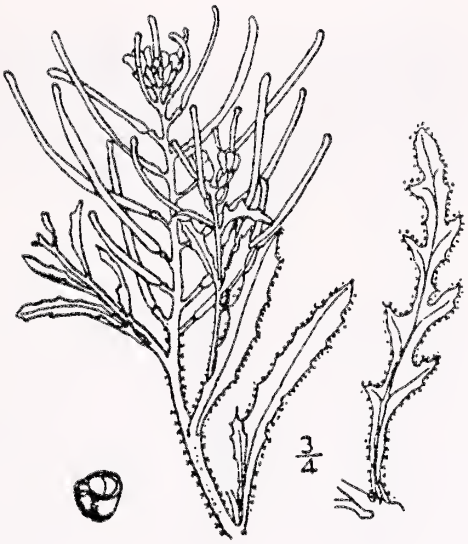
The seeds of this species are intensely bitter and have been used by country people as a vermifuge, hence one of its common names Wormseed or Treacle Wormseed. Johnson (1867) states that this species also "formed an ingredient in the so-called Venice Treacle, and many quack and rustic medicines." The seeds have likewise been given in obstructions of the intestines as well as in rheumatism and jaundice, reportedly "with success."



Erysimum cheiranthoides--Wormseed-mustard
[From Muenscher (1952), Fig. 45, p. 261.]

When taken in small doses they are purgative, but care must be taken not to administer in too large doses. Densmore (1928) reports that the Chippewas boiled one root of this plant in a quart of water to make a decoction used externally in the treatment of skin eruptions; three or four roots were sometimes used in severe cases. Kingsbury (1964) remarks that the seeds of this plant have been responsible for the loss of swine in Canada.

In areas where this species has become an undesirable weed, Muenscher (1952) suggests that it can be brought under control by clean cultivation followed by hand hoeing. Grainfields should be disked or harrowed several times after the crop is removed to destroy autumn seedlings.



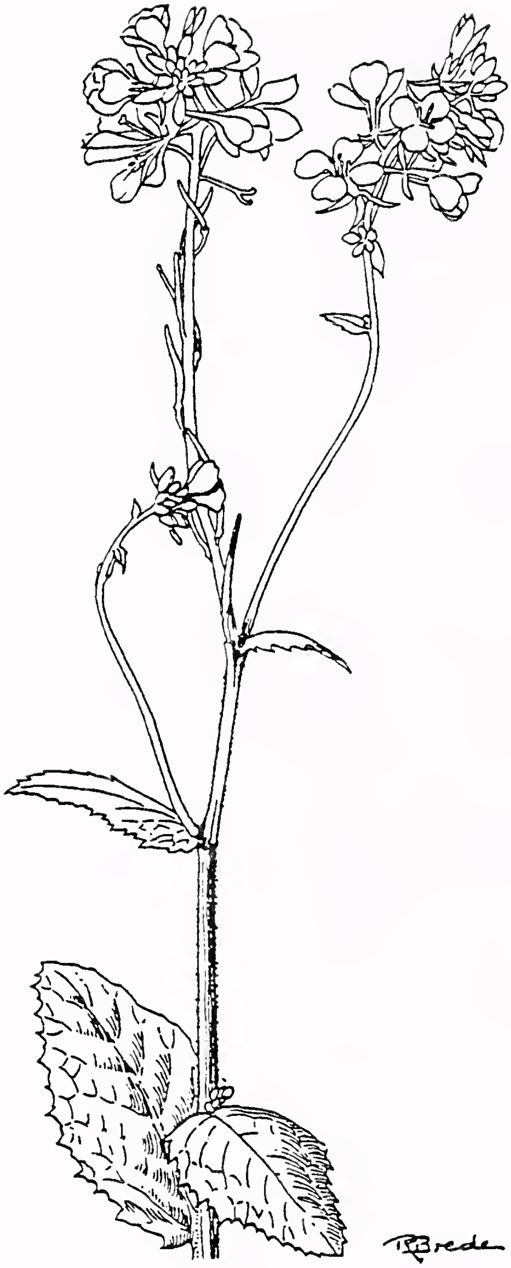
Erysimum repandum--Wavy-leaved Wormseed-mustard
[From Britton & Brown (1913), Vol. II, p. 173.]

Erysimum repandum L. Wavy-leaved Wormseed-mustard.

Meaning of Species Name. Wavy or undulate.
Other Names. Repand Cheirinia, Treacle-mustard.
Type of Plant. An annual herb, reproducing by seeds.
Habitat. A local adv in waste places.
Range. Mass to Ore, s to Ala, Kan, Ark, Tex, and Ariz.
Distr in NYS. Occasional as a waif near NYC.
Distr in the Torrey Range. Collected near NYC and Jersey City as waifs.
Time of Fl. May-Jul; Jul-Aug at Cornell.
Origin. Adv from Eu.

Hesperis L. Dame's Rocket.

There are about 20 species of Hesperis, all natives of Eurasia, including Japan, Asia Minor, and Europe. The name of the genus is derived from the Greek hesperis, evening or evening star, when the flowers are particularly fragrant. They are hardy biennial or perennial flowering plants with serrate sessile or petiolate leaves and large white, pinkish, or purple flowers. H. matronalis is an old-fashioned garden plant that has become naturalized in eastern North America. Other species for the garden include H. violacea, a biennial, and H. tristis. The last named is sometimes called Night-scented Stock (a name more correctly applied to Mathiola tristis); it thrives best on poor, light soil. It is biennial and must be raised from seeds sown annually in early summer.



Hesperis matronalis--Dame's Rocket
[From Smith (1966), Plate 69, p. 158.]

Hésperis matronàlis L. Dame's Rocket.

Meaning of Species Name. Matronly, from the old name Mother-of-the-evening.

Other Names. Dame's Violet, Queen's-gilliflower, Dame's-gilliflower, Night-scented Gilliflower, Rogue's-gilliflower, Damask-violet, Sweet-rocket, Summer-lilac.

Type of Plant. A biennial or perennial herb.

Habitat. Roadsides, thickets, fencerows, open fields, and open woods.

Range. Que and NS to Mich and Ia, s to Ga, Ky, O, Ind, and Kan.

Distr in NYS. Formerly cult for ornament and esc from cult.

Distr in the Torrey Range. Occasional throughout our area except in the pine barrens.

Time of Fl. May-Jul(Aug); Jun-Jul at Cornell.

Origin. Introd and natzd from Eu.

Lepidium L. Peppergrass.

There are about 130 species of Lepidium, plants of nearly cosmopolitan distribution, some 25 species of which occur in the United States. The name of the genus is derived from the Greek lepidion, a little scale, referring to the small flat fruit. They are herbs of temperate and warm regions with slender ascending racemes and uniform slender divaricate pedicels. Johnson (1867) observes that "the various species of the genus were in repute among our forefathers as remedies in many disorders, but none of them seem to have any property beyond the pungency and antiscorbutic tendency common to all the order [i.e., family]." The vigorously growing young shoots of the wild species in spring make a good substitute for Watercress or Garden Cress, and the peppery pods or seeds through the summer are an excellent seasoning for salads or soups. These seeds mixed with vinegar and very little salt also make a tasty dressing for meats.

L. sativum, Garden Cress, is grown as a salad plant, once valued for its antiscorbutic qualities. The seeds of L. latifolium, Dittander or Poor-man's-pepper, a native of Europe, northern Africa, and northern Asia, were once much used in Britain as a pungent condiment before the various substances now employed for such purposes became plentiful and cheap, hence the common name of Poor-man's-pepper, now generally applied to several members of this genus. It was formerly much cultivated in cottage gardens under the name of Dittander, but it has now almost disappeared as a culinary vegetable. Its roots are said to resemble Horseradish, for which it may be used as a substitute. The leaves can be used as greens and as an ingredient both in salads and in some sauces.

Other members of this genus have also been used as food. In Louisiana L. diffusum has been used as a watercress, while in eastern Mediterranean countries L. draba, Hoary Cress, is cooked and eaten as a potherb, and the seeds are substituted for pepper in seasoning. L. oleraceum, New Zealand Cress, grows abundantly along the seashores and was much sought as an antiscorbutic by early voyagers. It was subsequently taken to Great Britain and a report of 1870 states that it was there cultivated as a potherb. L. piscidum, Fish Poison, an extremely pungent cress of the Pacific islands, also was eaten by seamen as a relish and as a remedy for scurvy.

Although these common weeds are widespread and locally abundant, Martin et al. (1961) remark that their use by wildlife is slight and seems to be confined largely to the western states, where the small seeds, two to a pod, are eaten by birds and rodents.

Key to the Catskill Species of Lepidium

1. Plant densely villous; cauline leaves sagittate-clasping; silicles (seed pods) 5-6 mm long (auricles acute, much shorter than the rest of the blade; lower leaves essentially like the upper but progressively smaller) .... L. campestre
1. Glabrous or only minutely pubescent; cauline leaves tapering to base; silicles shorter, 2-4 mm long, 2
   2. Petals equaling or exceeding sepals; cotyledons accumbent (the edges against the radicle as shown in a cross-section of the seed); silicles 2.5-4 mm long (pubescence of inflorescence composed of curved, acute hairs).............. L. virginicum
   2. Petals wanting or shorter than sepals; cotyledons incumbent (with the back of 1 against the radicle), rarely oblique; silicles mostly 2-3 mm long, 3
      3. Branches bearing many short corymbiform racemes in the leaf axils as well as longer (2.4 dm long) terminal ones (in fruit).. L. ramosissimum
      3. Branches bearing simple naked elongate racemes (in fruit mostly 0.5-2.5 dm long)(nearly scentless; pubescence of inflorescence composed of minute stiff divaricate blunt hairs; lower leaves pinnatifid or toothed, upper stem leaves sharply acute)............................... L. densiflorum

Lepidium campestre (L.) R. Br. Cow-cress.

Meaning of Species Name. Of fields.

Other Names. Field Cress, Field Pepper-grass, Downy Pepper-grass, Bastard Cress, Yellow-seed, Mithridate Mustard, Glen-pepper, Poor-man's-pepper, Glen-weed, Drowd-weed, False Flax, English Pepper-grass.

Type of Plant. A winter annual or biennial herb, reproducing by seeds.

Habitat. Grain fields, new seedings, waste places, and roadsides.

Range. Throughout the northeastern states, adjacent Canada, and beyond; also in the Pacific states.

Distr in NYS. Frequent or common in many secs of the state.

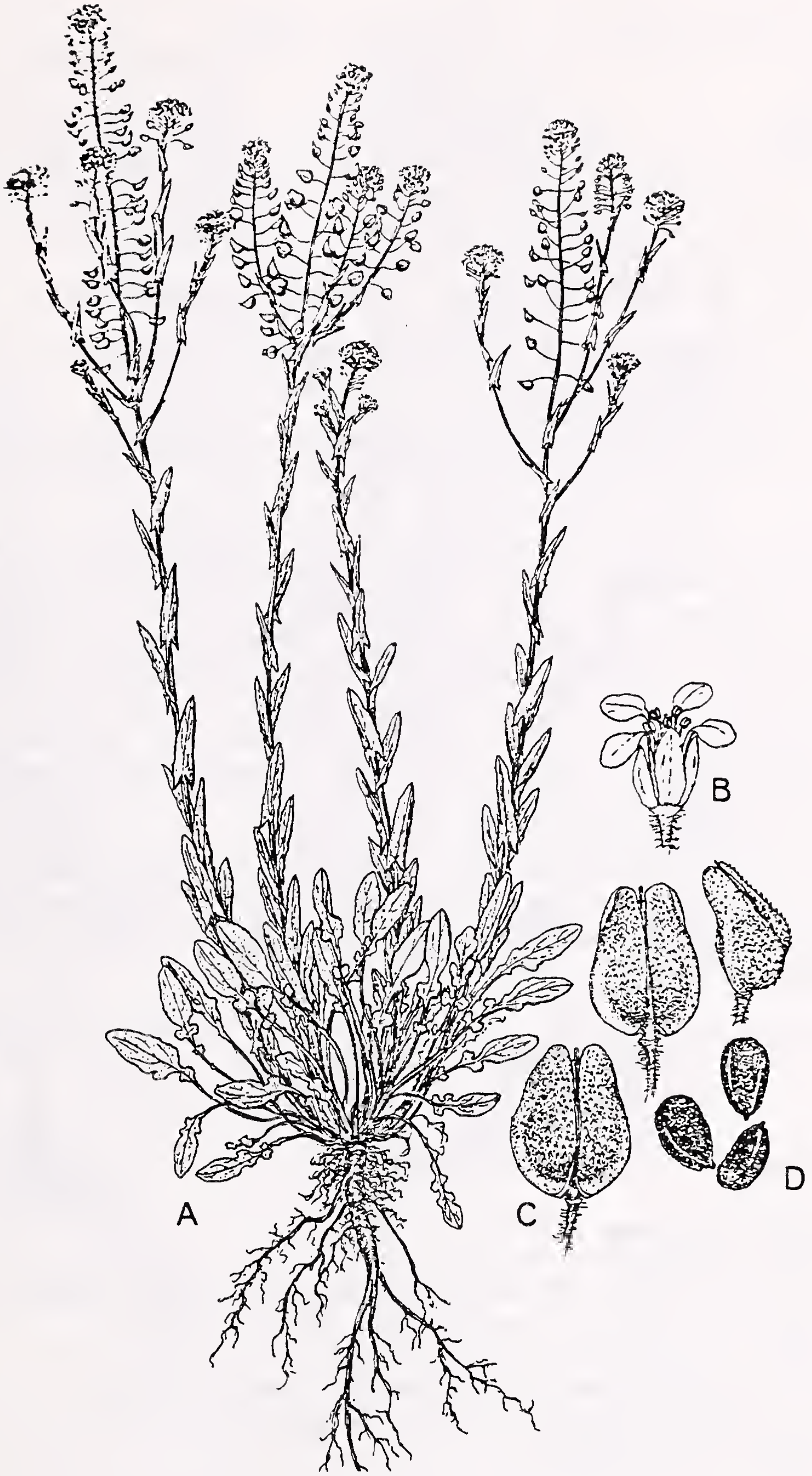
Distr in the Torrey Range. A troublesome weed in many parts of our range.

Time of Fl. May-Jun(Sep); Jun-Jul at Cornell.

Origin. Natzd from Eu.

Remarks. A common weed.

In meadows where this species may have become an obnoxious weed, Muenscher (1952) suggests that scattered plants should be hand pulled as soon as they begin to blossom, adding that "New seedings of clover and alfalfa should be cut early before the weed seeds are mature." In addition, "Badly infested fields should be plowed early and followed by a clean cultivated crop." It is necessary to continue cultivation late into the summer to destroy the last seedlings to appear, and surface cultivation after the crops are removed will destroy the autumn seedlings.



Lepidium campestre--Cow-cress
[From USDA Agr. Research Sv. (1971), Fig. 101, p. 207.]

Lepidium densiflorum Schrad. Peppergrass.

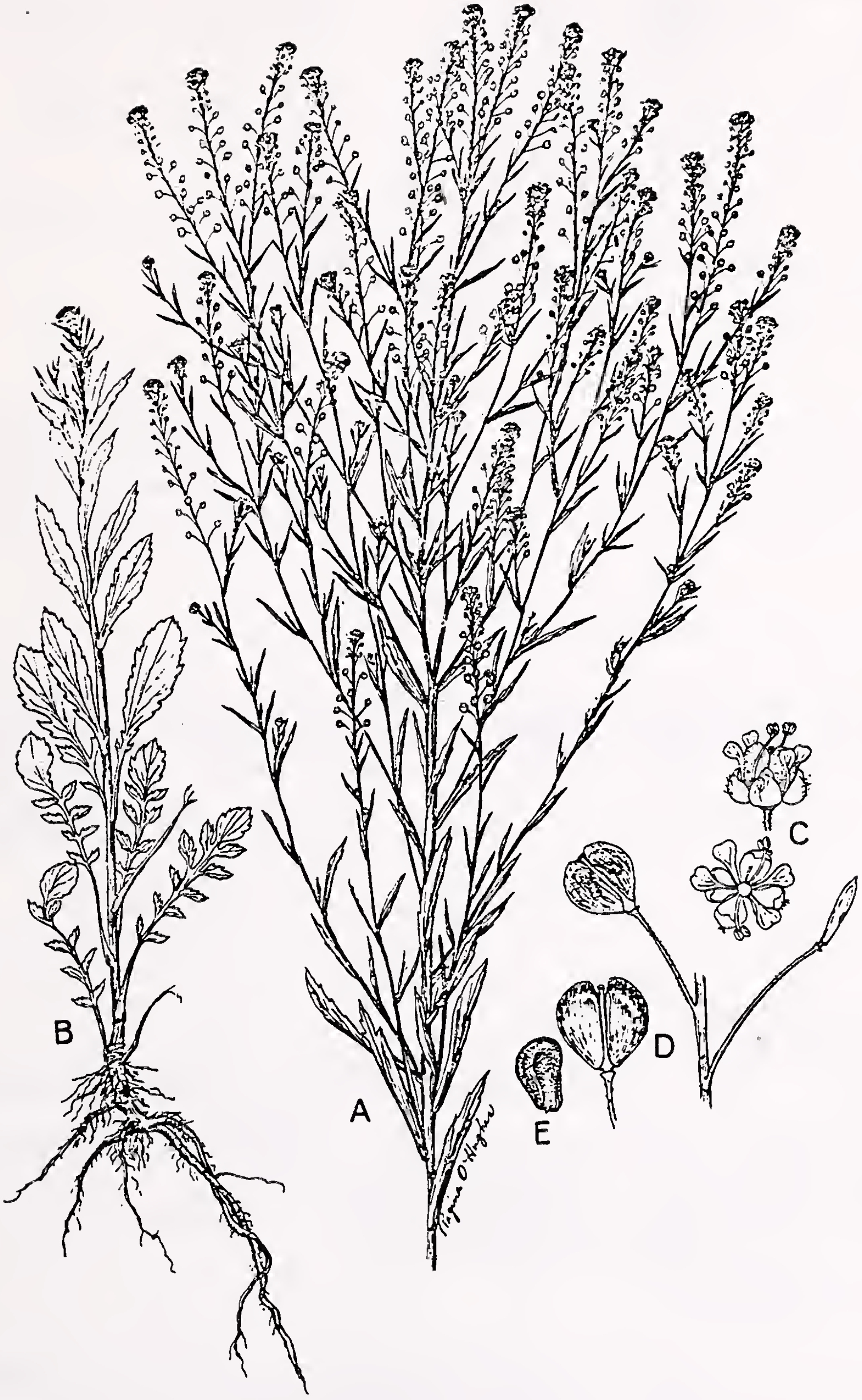
Meaning of Species Name. With crowded flowers.
Other Names. Green-flowered Peppergrass, Wild Tongue-grass, Wild Peppergrass.
Type of Plant. An annual or winter annual, reproducing by seeds.
Habitat. Dry or moist soil of roadsides, fields, meadows, pastures, neglected yards, and waste places, especially on light sandy soil.
Range. Que to Mont and Ore, s through most of the northeastern states and w to the Rocky Mts.
Distr in NYS. Frequent or common across the state s of the Adirondack reg.
Distr in the Torrey Range. Common throughout the area as a weed.
Time of Fl. (May)Jun-Jul(Sep); Jun-Sep at Cornell.
Origin. Probably adv in our area.
Remarks. A weedy species introd into Eu and on the Pacific coast; House (1924) states that it is natzd from Eu.

Gleason (1952) states that the only certain distinction between L. densiflorum and L. virginicum, both abundant in the Catskills, is in the position of the cotyledons (see key). Mature seeds can be cut transversely after a brief boiling (when examining dried specimens); the cotyledons are then visible under a 10X lens. In the Catskills, however, the writer has seen few plants of these two species that could not readily be distinguished. L. virginicum in general favors open meadows, gardens, and fields. It is also usually a taller plant with somewhat larger pods in a relatively lax raceme. L. densiflorum, on the other hand, seems to prefer situations where the soil is drier and more compact. It is usually only about half the size of L. virginicum and the racemes are much more compact. There seems also to be a difference in the pubescence of the two species, that of L. virginicum being composed of curved hairs acute at the tip while that of L. densiflorum is stiff, divaricate, and blunt.

In areas where this species has become an undesirable weed, it can be controlled by the same methods as those outlined for Capsella.

Lepidium ramosissimum Nels. Bushy Peppergrass.

Meaning of Species Name. Much Branched.
Type of Plant. An annual herb.
Habitat. Dry open soil of roadsides, wasteland, and along railroads.
Range. Rocky mts and the Great Plains to e Que and NY.
Distr in NYS. Not listed in House (1924).
Distr in the Torrey Range. Not listed in Taylor (1915).
Time of Fl. Jun-Oct; Aug-Sep in the Catskills.
Origin. Adv from farther w.
Remarks. Spreading eastw.



Lepidium virginicum--Poor-man's-pepper
[From USDA Agr. Research Sv. (1971), Fig. 102, p. 209.]

Lepídium virgínicum L. Poor-man's-pepper.

Meaning of Species Name. Of Virginia.
Other Names. Peppergrass, Bird's-pepper, Tongue-grass, Wild Peppergrass, Bird-seed, Hen-pepper.
Type of Plant. An annual or biennial herb, reproducing by seeds.
Habitat. Mostly on dry (or moist) open soil of fields, gardens, roadsides, and waste places.
Range. Nf to SD, s to Fla and Tex.
Distr in NYS. Common in most secs of the state outside the higher mts.
Distr in the Torrey Range. Common throughout the area.
Time of Fl. (May)Jun-Aug(Sep); Jun-Oct at Cornell.
Origin. Native.
Remarks. Adv in Eu.

The peppery seed pods are relished by canaries and other seed-eating cage birds. The seeds also furnish a tasty seasoning for soups and salads, and they can be mixed with vinegar and salt for a meat dressing. The young spring shoots are sometimes eaten raw sprinkled in salads as a substitute for watercress.

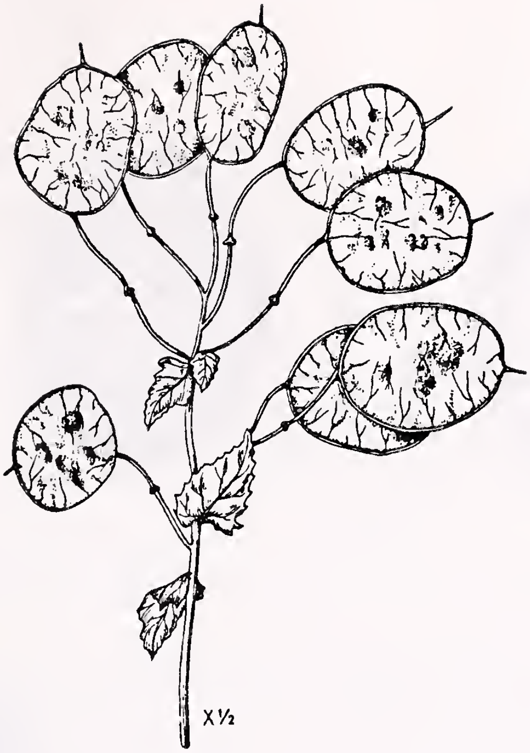
Lunària L. Honesty.

There are three species of Lunaria, hardy biennial (sometimes annual) and perennial plants, all natives of Eurasia. The name of the genus is derived from the Latin luna, moon, in allusion to the shape of the fruit of L. annua. They are sparsely pubescent herbs with cordate or deltoid-cordate, coarsely dentate, acuminate leaves, two species of which are cultivated as ornamentals.

Lunària ánnua L. Moonwort.

Meaning of Species Name. Annual.
Other Names. Honesty.
Type of Plant. A hardy biennial (sometimes annual) herb, reproducing by seeds.
Range. Occasionally esc in the ne states, Ont and Ct to NY and Pa.
Distr in NYS. Occasionally esc from gardens.
Distr in the Torrey Range. In 1915 known only from Westport, Ct.
Time of Fl. May-Jun; May-15-30 at Cornell.
Origin. Introd from Eu.
Remarks. Doubtfully est.

This native of Europe and western Asia grows 2-3 feet high and bears purplish flowers in May and June, followed by flat silvery pods that are prized for indoor decoration in dried flower arrangements. They are "of the easiest possible cultivation," thriving in poor soil and in shady as well as in sunny places. Self-sown seedlings often spring up freely. Stems carrying the seed pods should be cut in early autumn and hung upside down in a cool, airy room for a couple of weeks to dry thoroughly, after which they can be used by themselves for filling vases or combined with other dried

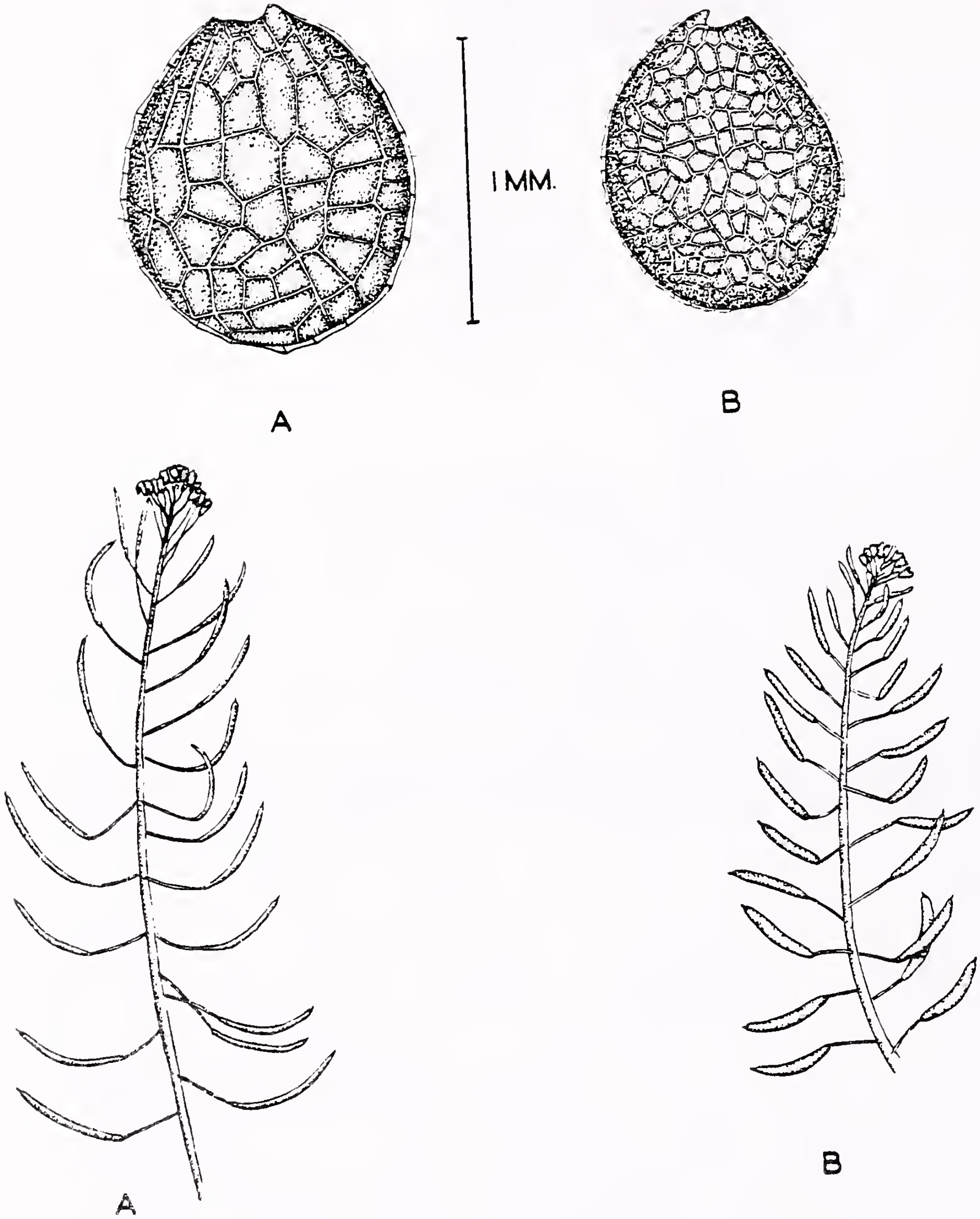


Lunaria annua--Moonwort
[From Gleason (1952), Vol. II, p. 219.]

plant materials to make attractive bouquets that will last throughout the winter months. This plant escapes only near areas where it is cultivated.

Nastúrtium R. Br. Watercress.

Until comparatively recently this taxon was thought to be a monotypic genus; yellow-flowered plants previously placed in this genus have been transferred to Rorippa. Nasturtium is an aquatic or paludal herb, a native of the old world, with a smooth succulent stem, often pinnate leaves, and white petals twice the length of the calyx. The name of the genus is derived from the Latin nasus tortus, a wry or twisted nose, alluding to the effect of the pungent odor of the plant. Green (1962) notes, first, that there are two species of Nasturtium in the new world, the diploid N. officinale, and a tetraploid, N. microphyllum. Second, he remarks that "it has become widely accepted that on a world basis Nasturtium is not distinguishable generically from Rorippa , and the names of the watercresses then become R. nasturtium-aquaticum (L.) Hayek ... and R. microphylla (Boenn.) Hyland ..." To make matters more interesting, there is also a sterile hybrid between the two species, known as R. x sterilis Shaw. Green further remarks that "Both species are natives of Europe, but both have been introduced into the New World, presumably because of their use and value as a salad." His distribution map shows that, while R. nasturtium-aquaticum is much the more widespread, both species occur from coast to coast. Material from the Catskills requires further study, although it would appear that R. nasturtium-aquaticum is the prevailing species. The two species can readily be distinguished by reference to the accompanying illustrations. The writer has chosen to retain the more familiar name of Nasturtium only in part to avoid the necessity for rewriting three keys.



Fruits, inflorescences, and seeds of (A) Nasturtium officinale
and (B) N. microphyllum
[From Rhodora 64: 33-34, 1962.]

It should be noted that the plants grown in gardens for their showy flowers as Nasturtium are botanically called Tropaeolum and belong to the Tropaeaceae, a family in the order Geraniales. The transfer seems to have come about through the similar taste of the centrally attached round leaves, the showy flowers, and the plump fruits of Tropaeolum.

Nasturtium officinale R. Br. Watercress.

Meaning of Species Name. Of the shops, alluding to the fact that it was once available in apothecary shops for medicinal use.

Other Names. Well-grass, Water-grass, Crashes, Brooklime, Browncress.

Type of Plant. A perennial herb.

Habitat, Brooks, springheads, rills, and cool waters.

Range. Throughout the US and s Canada.

Distr in NYS. Common in most secs of the state.

Distr in the Torrey Range. Common as an esc from cult in most parts of the range.

Time of Fl. Apr-Oct; Jun-Jul at Cornell.

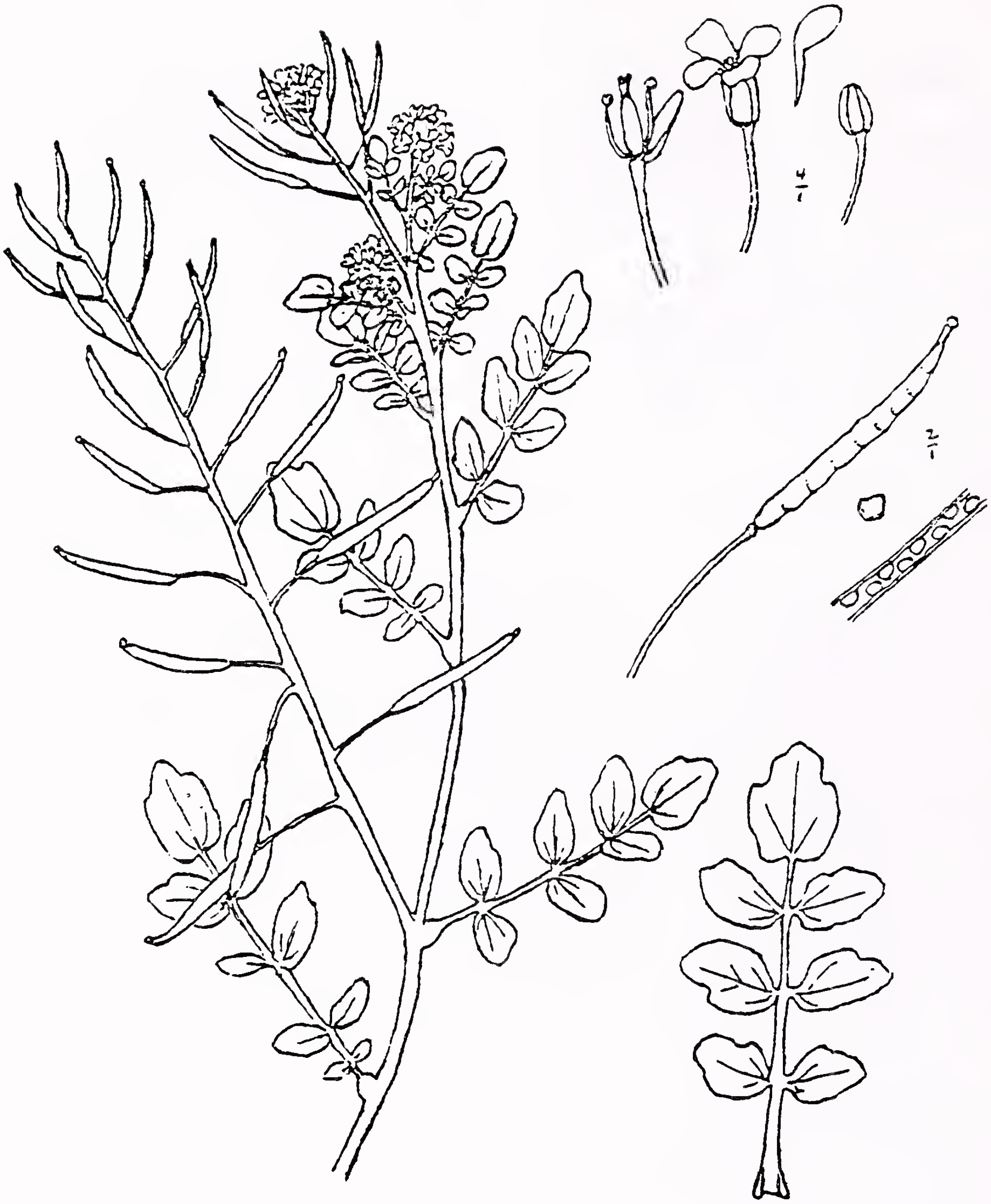
Origin. Introd from Eu.

Remarks. Still in current demand as a drug plant.

DeCandolle believed this plant to be a native of Persia, its culture subsequently spreading to Syria, Greece, Egypt, India, and Abyssinia. It was said by Xenophon around 400 B.C. to have been eaten by the Persians before they became acquainted with bread. During the first century A.D. Pliny speaks of this species as growing to a remarkable size in Arabia. Watercress was also a popular plant with the Greeks and Romans. It has likewise been cultivated in England since 1548; Gerarde remarked that "the cresses may be eaten with bread, and so the Ancient Spartans usually did; and the low-countries men many times doe, who commonly use to feed of Cresses with bread and butter." It was also combined with other salad herbs, "and for this cause it is chiefly sown." In 1806 McMahon mentioned three varieties as being grown in American gardens. The young leaves have a warm pungent taste, excellent for making salads, particularly when combined with lettuce or other salad plants. Curled varieties are often grown commercially for use as garnishes. One authority stated that its pungent flavor is caused by a volatile oil containing sulphur.

The familiar Watercress of the grocery store is widely naturalized in North America in clear streams or about springs. While it is rarely found far from the haunts of man, it can be found growing wild in every state of the continental United States and all the way across the southern half of Canada. Not only does it have a wide range, it has one of the longest seasons of any of the salad plants, being available practically every month of the year except for the very coldest months. When gathering Watercress in the wild, however, great care should be taken not to confuse other plants with it, for the deadly water-hemlocks grow in habitats similar to those where Watercress is often found. In addition, if there is any doubt about the purity of the water in which the Watercress is growing, it should be disinfected by soaking it in water to which a water-purifying tablet has been added; these can be purchased from handlers of camping supplies. This precaution is unnecessary if the Watercress is to be cooked.

Watercress is grown for the market in specially prepared beds; the small plants are set in the soil at the bottom of the bed and the surface is covered with fine gravel to keep it clean, after which a stream of fresh water to a depth of 3 or 4 inches is kept constantly running through them. The beds are cleaned out and replanted twice a year, in May and October. Watercress can also be grown at home in any situation where fresh running



Nasturtium officinale--Watercress
[From Stone (1945), Vol. I, p. 667.]

water is available. In the Catskills an ideal place to plant Watercress is near the overflow of a spring seep or along the edge of a small stream or brook. The tips of shoots some 2 inches in length can be planted in either place. It is also possible to buy Watercress seed from commercial suppliers of seed and nursery stock. The seeds should be soaked overnight so they will sink, then scattered thinly along the edge of a running stream where the water is from 1 to 3 or 4 inches deep, but not where the water is running too swiftly. Watercress can also be grown in large tanks or tubs, but the success of this method depends on the frequent draining off and replenishing of the water, the ideal being a constant flow.

The use of raw Watercress in salads, as a garnish, and as a filling for bread-and-butter sandwiches is familiar to nearly everyone, but it is useful in other ways as well. It can be cooked alone as a potherb, making better "greens" than many of those obtained at the supermarket. Not only is Watercress more flavorful, but it is richer in vitamins A and C and in trace minerals than those obtained at the store. Used in this way, it is cooked, seasoned, and served exactly as one would cook Spinach. A handful of Watercress can likewise be added to other greens to enhance their flavor. It also makes a much more flavorful "bed" on which to serve gelatin salads than does the usual lettuce leaf. When gathering Watercress, care should be taken not to pull up the whole plant by the roots; simply pinch or snip off the side and end shoots. The plant will quickly grow new ones for later use.

Watercress soup makes a tangy appetizer that will be much appreciated at the beginning of any lunch or dinner. To make it mix 2 tablespoons of flour and 2 tablespoons of milk to a smooth paste in a medium-sized saucepan. Slowly stir in 3 cups of milk, 1 teaspoon of salt, and 1 tablespoon of minced onion. Cook, stirring constantly, until the mixture thickens and comes to a boil. Remove from heat and stir in 2 cups of finely chopped Watercress, or, if preferred, Watercress that has been liquefied in a blender. Serve immediately garnished with a fresh sprig of Watercress. Another way to serve Watercress is to heat 2 tablespoons of cooking oil in a large skillet. Sprinkle 1 tablespoon of grated fresh ginger root in the hot oil, cook about 2 minutes, then add 1 pound of well-washed Watercress. Cook and stir for 4 minutes to wilt the cress and coat it with oil, then remove from the heat, toss with 2 tablespoons of soy sauce, and serve immediately. A handful of Watercress is also particularly good in stews, to which it should be added during the last 10 or 15 minutes of cooking. For those who may wish to experiment further with this plant, Berglund and Bolsby (1971) offer additional recipes, including Creamed Watercress, Watercress Pancakes, Baked Pike Stuffed with Watercress and Wild Rice, Watercress Omelet, and Sauteed Watercress with Calves Liver.

In medicine Watercress has been considered particularly valuable for its antiscorbutic qualities, for which it has been used from the earliest of times. Johnson (1867) states that "Xenophon attributed still greater virtues to it, recommending the Persians to give it to their children as a means of adding to their strength and stature. In the time of Pliny it was still given with vinegar as a remedy for insanity and kindred affections, and was also in high esteem as a salad." The _U.S. Dispensatory_ of 1865 observed that "In sensible and medical properties it bears some resemblance to scurvy grass, though milder, and on this account is preferred for the table." The expressed juice was sometimes given in doses of 1 or 2 ounces, but the herb was more frequently used in the form of a salad in the treatment of visceral obstructions and scorbutic afflictions. Being rich in vitamins A and C, it was an effective remedy for scurvy and related disorders. Its active principles were considered to be at their best when the plant was in flower. Johnson further observes that "The Water-cress is now seldom used otherwise than as a salad, but formerly it was in high repute for its medicinal qualities, and, boiled with scurvy-grass [_Cochlearia officinalis_], brooklime [_Veronica beccabunga_], and Seville oranges, formed the 'spring-juices' so much esteemed by our grandmothers, as a health-giving draught for children in the vernal season. It is probable that the fresh leaves, eaten as a salad, are far more beneficial than any such nauseous compounds; they certainly form the most pleasant, and probably one of the most effectual of anti-scorbutics ..." It is reported that Spanish-speaking New Mexicans currently employ Watercress in the treatment of kidney and heart ailments and that it is crushed in cold water as a remedy for tuberculosis. The fresh plant has also been used to treat constipation, although pregnant women have been warned that it may cause abortion. In some areas a cough medicine is made by soaking the crushed leaves in honey overnight. In Africa it is believed to cause temporary sterility, but it has been used as an aphrodisiac as well as to treat asthma and head colds. Culpepper stated that the bruised leaves or the juice would remove blotches, spots, and blemishes from the face when applied as a lotion.

Steyermark (1963) reports that "The leaves are eaten by ducks, muskrats, and deer, and the plants serve as shelter for small aquatic life."

Ráphanus L. Radish.

This is a Eurasian genus of eight species. The name of the genus is the ancient Greek name of the Radish, derived from raphanos, quickly appearing, alluding to its rapid germination. They are annual or biennial herbs.

The familiar garden vegetable is a hardy annual, probably of oriental origin, that is found wild in various parts of Europe. There are numerous varieties in cultivation, varying in size, shape, and color. By making sowings at different times during the year it is possible to maintain a supply of radishes throughout the cooler months when the temperature is high enough for growth. The Rat-tailed Radish, R. caudatus, also an annual, is grown for the sake of its large seed pods, which are eaten fresh or used as a pickle. The leaves and slender roots of R. maritimus, the Black Radish, are mentioned by Dioscorides as being eaten as a potherb. According to Walker, writing in 1831, the large succulent roots are preferable to Horseradish for the table. The radical leaves of R. landra, the Italian Radish, are eaten as a salad by the poor inhabitants of some regions.

Key to Local Species of Raphanus

1. Flowers white or purplish; pods 2-3-seeded, not ribbed, the seed-bearing part short and thick, at maturity 6-10 mm in diameter, spongy, not constricted between the seeds........... R. sativus
1. Flowers pale yellow (drying white); pods 4-10-seeded, conspicuously ribbed on the enlarged corky portions, the seed-bearing part longer and more slender, 2-3 mm in diameter, constricted between the seeds when dry.................. R. raphanistrum

Ráphanus raphanístrum L. Wild Radish.

Meaning of Species Name. An old generic name used by Tournefort.

Other Names. Jointed Charlock, White Charlock, Jointed Radish, Wild Kale, Wild Turnip, Cadlock, Wild Rape, Black Mustard, Wild Mustard, Warlock, Curlock, Shedlock, Kraut-weed.

Type of Plant. An annual or winter annual, reproducing by seeds.

Habitat. Estab as a weed in fields, roadsides, and waste places.

Range. Nf to BC, s to Va, Ky, Ind, Ia, Kan, Tex, and Cal.

Distr in NYS. A frequent weed westw and southw in the state; infrequent northw.

Distr in the Torrey Range. Common throughout the area except in the pine barrens, there rare or wanting.

Time of Fl. (Apr)Jun-Aug(Nov).

Origin. Natzd from Eu.

This troublesome weed of Europe, a wild radish found along the Mediterranean, has become naturalized almost throughout the northern United States and adjacent Canada. Johnson (1867) states that "The Radish was grown by the Egyptians and Greeks in very ancient times, when it was hardly likely to have been introduced from so remote a country as China ..." Its leaves have been used as a salad in the Outer Hebrides. Johnson also noted that in his time it was so common in the grainfields of England that its pungent seeds were separated from the grain and sold as Durham mustard seeds, which made an excellent substitute for mustard.

The crushed seeds of this plant are emetic, and the root is diuretic and laxative, but very little use has been made of it in medicine, although in some areas a tincture of the fresh roots, gathered when well formed at flowering time, has been prepared for medical use.

Johnson likewise remarks that "it would answer well for fodder, being relished by cattle and sheep, a remark that would, however, apply equally to most crucifers, the herbage of which is not extremely pungent," but Kingsbury (1964) states that Wild Radish is considered dangerous to livestock both in Europe and in the United States, although reports of toxicity are few. Nevertheless, ingestion of the flowering tops was associated with loss of lambs in France and the plant has been incriminated in the poisoning of dairy cattle in Australia.

In areas where this species has become an undesirable weed, Muenscher (1952) states that it can be brought under control by clean cultivation followed by hand weeding in cultivated crops, adding that "Spring weeding with a harrow on a warm day when the grain is about 4 inches high will destroy most of the seedlings." In addition, "Frequent disking or harrowing of stubble fields will induce seed germination." In grainfields and meadows scattered plants should be pulled up by hand as soon as the plants begin to blossom. Chemical sprays may be necessary in badly infested grainfields.

Ráphanus satìvus L. Radish.

Meaning of Species Name. Planted.

Other Names. Garden Radish, Wild Radish.

Type of Plant. An annual or biennial herb, reproducing by seeds.

Habitat. Cult ground, old fields, and waste places.

Range. Sporadic in the n states and adjacent Canada.

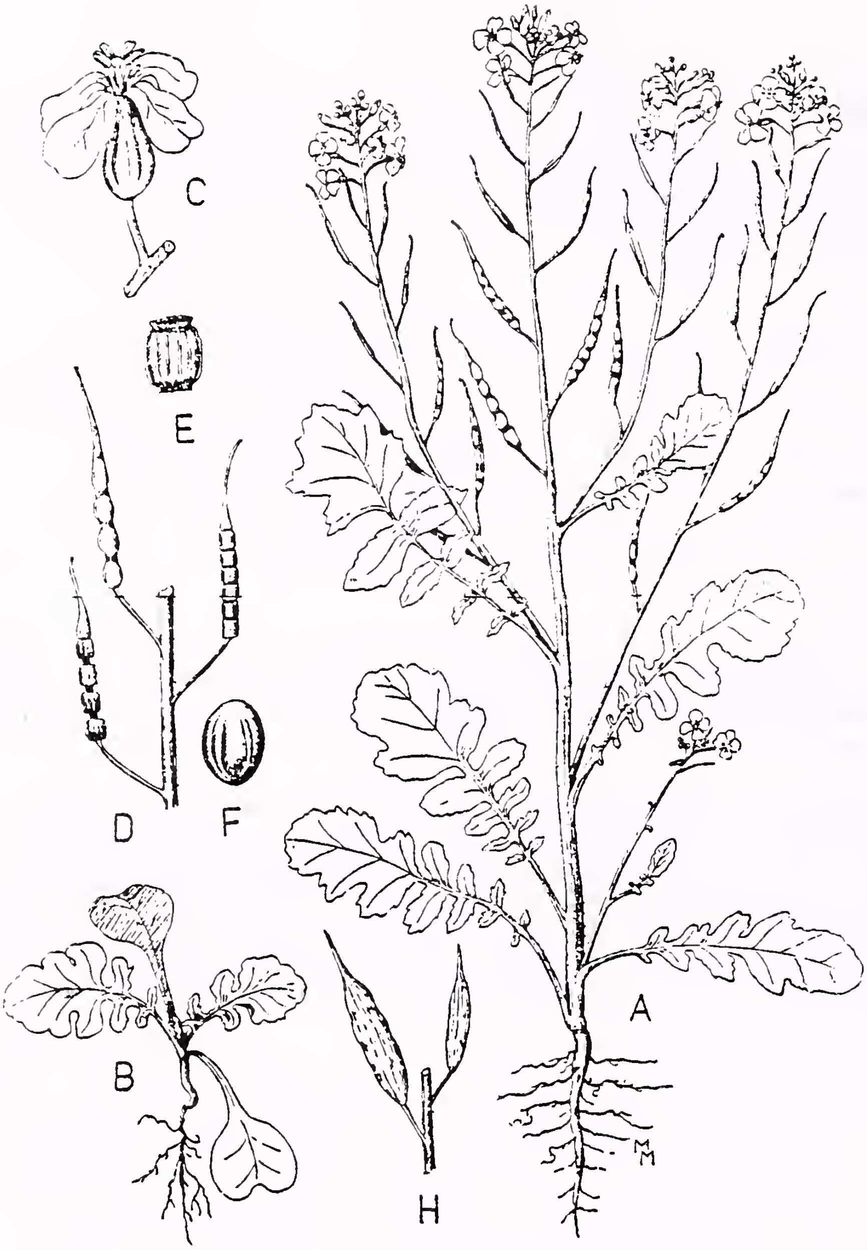
Distr in NYS. Occasionally spontaneous or persistent for a season or two in neglected ground.

Distr in the Torrey Range. A rather uncommon and fleeting esc.

Time of Fl. Summer.

Origin. Introd from Eu.

Remarks. Probably never fully estab.



Raphanus raphanistrum--Wild Radish
A, plant showing general habit; B, seedling in about the stage when spraying is most effective: C, flower; D, mature fruits (seed-pods); E, a piece of broken seed-pod containing one seed; F, seed.

Raphanus sativus--Radish
H, mature seed-pods.

[From Muenscher (1952), Fig.44, p. 259.]

According to Sturtevant (1919), China is the native land of the Radish, where, as in neighboring Japan, many varieties are cultivated, among them an oil plant. It is also found wild in the Mediterranean region and was mentioned so frequently by ancient writers that some authors think it may be a cultivated form of R. raphanistrum. Radishes were extensively cultivated in Egypt in the time of the Pharaohs. Li (1969) states that "The radish is considered as having originated in Europe and been introduced into China in ancient times. It was apparently a vegetable of secondary importance at that time. Now it is the most important tuber vegetable in China, replacing the turnip of ancient times. It is now extensively cultivated not only in China but also in Japan and eaten in many ways, fresh, salted, dried, pickled, etc. Many forms have also since been developed."

It does not appear to have reached England until 1548, and Gerard mentions four varieties as being cultivated in 1597, "eaten raw with bread," but for the most part "used as a sauce with meates to procure appetite." Radishes were cultivated in Massachusetts in 1629, and McMahon mentioned 10 varieties in his list of American garden vegetables, compiled in 1806.

The leaves can be boiled as greens or eaten as a cress, the old roots can be boiled and served like Asparagus, or the seed pods can be used for pickles, but they are usually eaten raw with salt as a relish or cut up in tossed salads. In Korea and Japan the roots are in general and universal use, being served as a vegetable and sometimes in almost every dish. In India the Radish is cultivated principally for the vegetable formed by the young pods and for its oil. In upper Egypt a variety is cultivated of which only the leaves are eaten; the Arabs are said to be very fond of Radish tops, which they eat "with as much relish as donkeys."

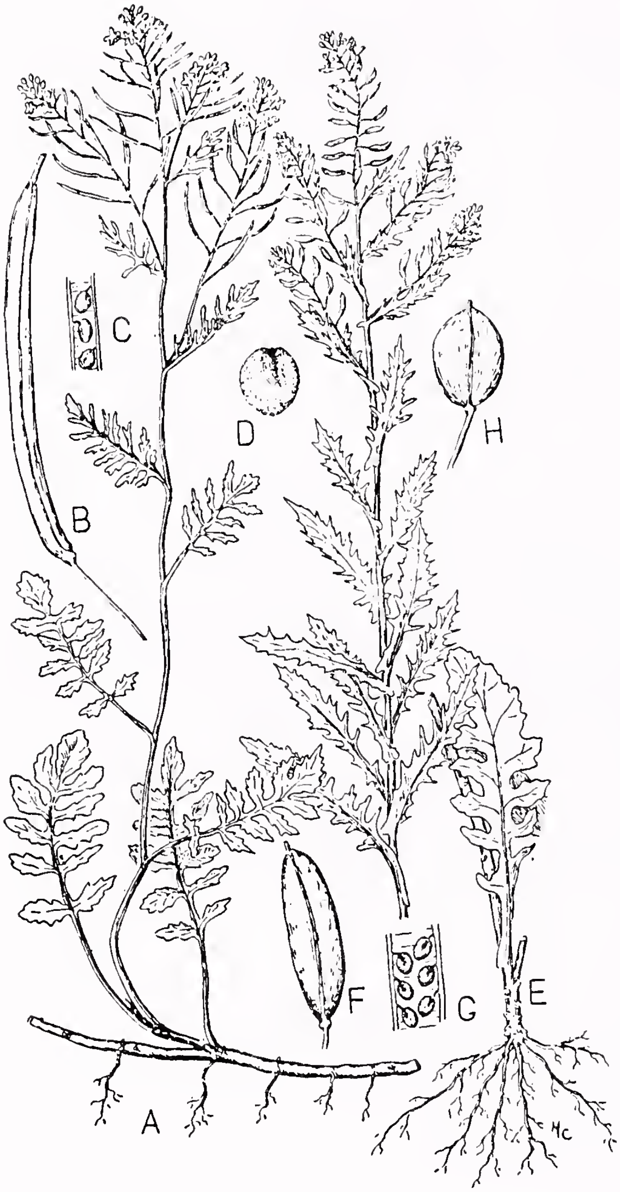
In areas where this species has become an undesirable weed, it can be controlled by the same methods as those outlined for _R_. _raphanistrum_.

Rorippa Scop. Yellow Cress.

There are about 40 species of _Rorippa_, of wide distribution in the tropical and temperate zones of both hemispheres. The name of the genus is a latinization of an old Saxon word, _rorippen_, for some kind of mustard. They are usually glabrous aquatic to terrestrial plants with yellow petals, small nectariferous glands, and commonly pinnate or pinnatifid leaves. There are only two species growing wild in the Catskills, but _R_. _islandica_ has been separated into three more or less intergrading subspecies. Although only ssp. _fernaldiana_ is thus far known to grow in the Catskills, there is a possibility that diligent search may also locate at least one of the other two.

Key to Pertinent Species and Subspecies of Rorippa

1. Petals 4-8 mm long, showy, longer than the sepals; perennial plants with creeping rhizomes; siliques (seed pods) slenderly linear-cylindric, 1-2.5 cm long.............................. _R_. _sylvestris_
1. Petals none or up to 2 mm long, shorter than to equaling, not exceeding, the sepals; annual or biennial without creeping underground stems; siliques oblong-linear to globose, 0.5 cm long or less, 2
    2. Upper as well as lower leaves pinnate (cut to the midrib) or deeply pinnatifid (rather deeply cut); plant generally delicate, with thin glabrous leaves.......... _R_. _palustris_ ssp. _palustris_



Rorippa sylvestris--Creeping Yellow Cress
A, part of plant showing habit; B, seed-pod; C, section of pod showing one row of seeds; D, seed.

Rorippa palustris ssp. palustris--Marsh Cress
E, part of plant showing habit; F, seed-pod; G, section of pod showing two rows of seeds.

Rorippa palustris ssp. hispida--Hispid Marsh Cress
H, seed-pod.

[From Muenscher (1952), Fig. 50, p. 272.]

2. Upper leaves coarsely or shallowly toothed to only slightly toothed or nearly entire, not deeply parted nor pinnate; plants generally stout and coarse, with firm leaves, 3
   3. Stem and leaves more or less hirsute; fruits ovoid to broadly ovoid-oblong, commonly (2.5)3-4(4.5) mm long.................................... *R. palustris* ssp. *hispida*
   3. Stem and leaves usually glabrous, except sometimes on lower part of stem; fruits nearly cylindric or narrowly ellipsoidal, commonly (4)4.5-6(7) mm long................................ *R. palustris* ssp. *fernaldiana*

Roríppa palústris (L.) Bess. ssp. *fernaldiána* (Butt. & Abbe.) Hult. Marsh Cress.

Meaning of Species Name. Of marshes; ssp. name, to honor Merritt Lyndon Fernald (1873-1960).

Type of Plant. An annual or biennial herb.

Habitat. Wet shores, damp openings, and waste places.

Range. Lab to BC, s to NS, Va, Tenn, La, Tex, NM, and Cal; also in e Asia.

Distr in NYS. Frequent or common across the state outside the Adirondacks.

Distr in the Torrey Range. Throughout the area except in the pine barrens of NJ, there rare or wanting; rare in the reg surrounding the pine barrens, always increasing northw.

Time of Fl. May-Oct; Jun 20-Sep at Cornell.

Origin. Native, according to Fernald (1950); House (1924) states "Naturalized from Europe, but said to be native westward."

Roríppa sylvéstris (L.) Bess. Creeping Yellow Cress.

Meaning of Species Name. Of woods.

Other Names. Creeping Yellow Watercress, Yellow Cress.

Type of Plant. A perennial herb with subterranean creeping rootstocks.

Habitat. Wet soil of meadows, shores, and roadsides.

Range. Nf and Que to ND, s to NC, Ky, La, and Mo.

Distr in NYS. Frequent in most secs of the state.

Distr in the Torrey Range. Throughout the range except in the pine barrens, there rare or wanting.

Time of Fl. May-Aug(Sep); Jun-Aug at Cornell.

Origin. Natzd from Eu.

This rapidly spreading species is often a troublesome weed. Muenscher (1952) suggests that it can be brought under control, in areas where it has become obnoxious, by early and late clean cultivation, spraying with a weed killer, and/or covering with mulch paper.

Sisymbrium L. Tumble-mustard.

There are about 80 species of *Sisymbrium*, according to Shulz's interpretation, natives of temperate zones in both hemispheres. A few species are native to the western states, but ours are annuals or biennials from the old world. The name of the genus is derived from *sisumbrion*, an ancient Greek name for some pungent plant, probably the Watercress. They have yellow flowers, pubescence of simple hairs or none, and pinnatifid to entire leaves.

S. sophia, Flixweed, was at one time an official drug plant, used externally for treating indolent ulcers and internally in the treatment of worms and calculous complaints. *S. muralis* was used in France during the 1800's in the treatment of scurvy and scrofula, usually administered in the form of a syrup with iodide of potassium. The seeds of *S. canescens*, Tansy Mustard, are reported to be collected by the Indians of California, presumably for use as a food item.

Key to Local Species of *Sisymbrium*

1. Upper cauline leaves finely divided into slender threadlike divisions; pods linear, 6-10 cm long, widely spreading; pedicels 5-10 mm long; petals 5-8 mm long, pale yellow.............. *S. altissimum*
1. Upper cauline leaves either,coarsely cut or sometimes nearly without teeth; pods subulate, 1-2 cm long, strongly appressed to the stem; pedicels 2-3 mm long; petals 2-3 mm long, bright yellow, 2
    2. Pods and foliage puberulent.............. *S. officinale* var. *officinale*
    2. Pods and foliage glabrous............... *S. officinale* var. *leiocarpum*

Sisymbrium altissimum L. Tumble-mustard.

Meaning of Species Name. Tallest.

Other Names. Tumbling-mustard, Jim Hill Mustard, Tall Hedge Mustard, Tall Sisymbrium.

Type of Plant. An annual or winter annual, reproducing by seeds.

Habitat. Grain fields, new seedings, cult ground, roadsides, and waste places.

Range. Que to BC, s to Fla, Tex, and Cal.

Distr in NYS. Common in most secs of the state, especially about cities and towns and along railroads.

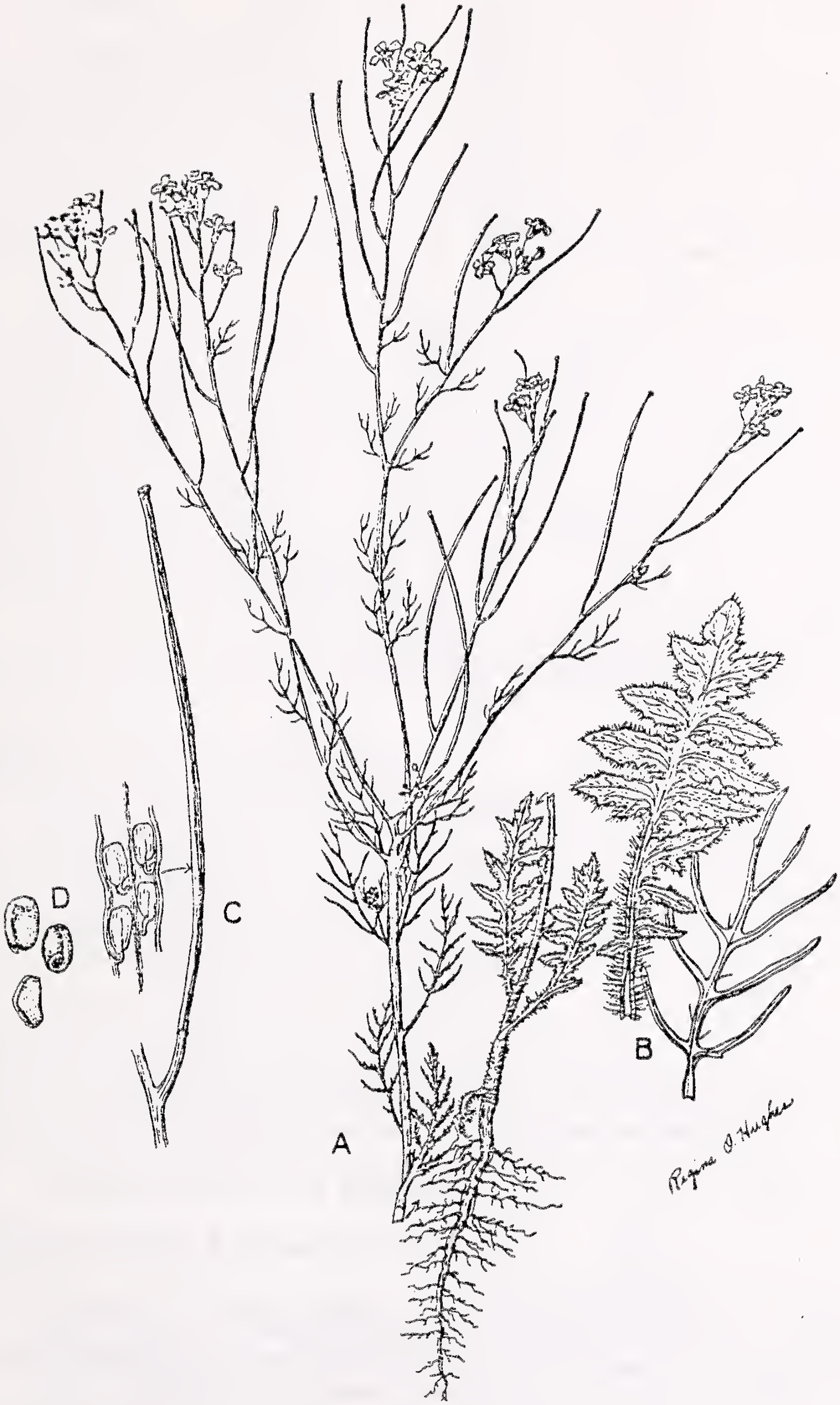
Distr in the Torrey Range. Common throughout the range except in the pine barrens, there rare or wanting.

Time of Fl. Jun-Jul; Jun-Sep at Cornell.

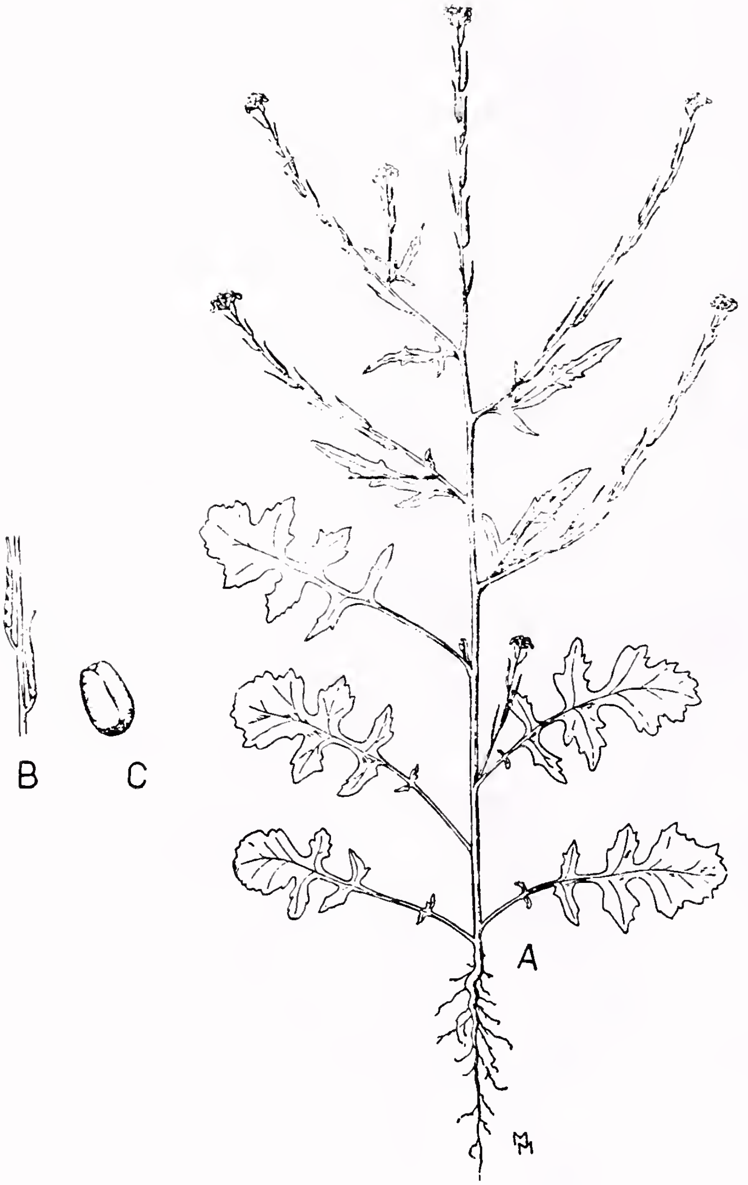
Origin. Natzd from Eurasia.

Remarks. More abundant northw; a bad weed in the nw states.

In areas where this species has become an obnoxious weed, Muenscher (1952) states that clean cultivation will bring it under control. Stray plants should be hand pulled or hoed before seeds are formed. Grainfields should be harrowed or disked several times after the crop is removed, repeated in the spring, and plowed two weeks later, while badly infested grainfields should be harrowed two or three times when the grain is 3 to 6 inches high.



Sisymbrium altissimum--Tumble-mustard
[From USDA Agr. Research Sv. (1971), Fig. 104, p. 213.]



Sisymbrium officinale--Hedge-mustard
[From Muenscher (1952), Fig. 47, p. 266.]

Sisýmbrium officinàle (L.) Scop. var. *leiocárpum* DC. Hedge-Mustard.

Meaning of Species Name. Of the shops, from its former repute in medicine; var. name, smooth-fruited.

Other Names. Hedge-weed, California Mustard, Bank-cress, Scrambling Rocket, Singer's Plant, St. Barbara's Hedge Mustard.

Type of Plant. An annual or winter annual, reproducing by seeds.

Habitat. Fields, gardens, roadsides, and waste places.

Range. Que and NS to BC, s generally throughout the US.

Distr in NYS. Common throughout the state.

Distr in the Torrey Range. Common everywhere.

Time of Fl. May-Oct; Jun-Sep at Cornell.

Origin. Natzd from Eu.
Remarks. Var. *officinale* is less common than var. *leiocarpum*.

Hedge-mustard, a native of Europe and northern Africa that is now generally naturalized throughout the United States, has been used as greens or as a substitute for Spinach in many parts of Great Britain. Johnson (1867) observed that it was even occasionally cultivated as a potherb but remarked that it was "not very palatable." In his work on American gardening, published in 1832, Bridgeman remarked that it has "a warm and acrid flavor," in some areas used as an "early potherb"; another authority stated that it "makes a particularly good potherb if gathered young."

This species was at one time an official drug plant, in France named the Singer's Plant, it having been considered up to the time of Louis XIV an infallible remedy for loss of voice and hoarseness. Racine, in writing to Boileau, suggested that he try the syrup of Erysimum in order to be cured of voicelessness. A strong infusion of the whole plant used to be taken in former days for all diseases of the throat. As reported by the *U.S. Dispensatory* of 1865, "The herb is said to be diuretic and expectorant and has been recommended in chronic coughs, hoarseness, and ulceration of the mouth ... The juice of the plant may be used mixed with honey or sugar, or the seeds may be taken in substance."

In areas where this species has become an undesirable weed, it can be controlled by the same methods as those outlined for *S. altissimum*.

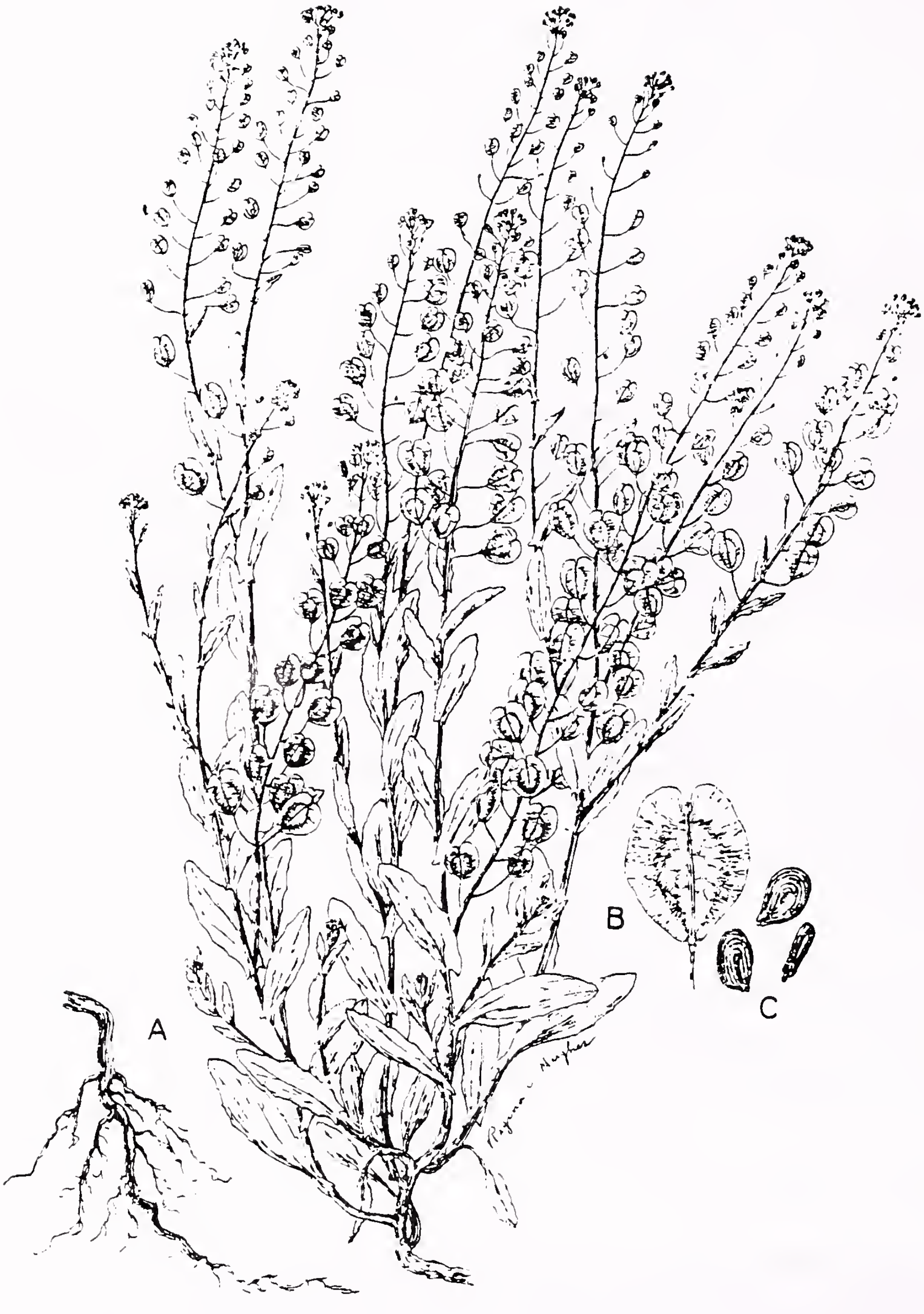
Thláspi L. Penny-cress.

There are about 60 species of *Thlaspi*, mostly natives of Eurasia, but six species are native to the western states. *Thlaspi* is the ancient Greek name of some cruciferous plant, the name of which is derived from *thlaein*, to crush, from the flattened fruits. They are mostly hardy annual and perennial herbaceous plants with undivided radical leaves and small white or purplish flowers, the cauline leaves sagittate and clasping.

Only one species, *T. rotundifolium*, is much cultivated for ornament, although a few others may be found in rock gardens where large collections of plants are grown. *T. rotundifolium* is a small rock-garden plant that forms a compact tuft a few inches high. It has small roundish or oval leaves and dense, short-stemmed clusters of fragrant rosy-lilac, four-petaled flowers in summer. It requires a sunny location and well-drained, sandy compost.

Thláspi arvénse L. Penny-cress.

Meaning of Species Name. Of cultivated land.
Other Names. Field Penny-cress, Mithridate-mustard, Frenchweed, Fanweed, Stinkweed, Bastard Cress, Dish-mustard, Treacle-wort.
Type of Plant. A glabrous erect annual or winter annual, reproducing by seeds.
Habitat. Grainfields, gardens, roadsides, and waste places.
Range. Gl, Lab, and Nf to Ak, s to Fla, Ark, and Cal.
Distr in NYS. Infrequent or rare.



Thlaspi arvense--Penny-cress
[From USDA Agr. Research Sv. (1971), Fig. 105, p. 215.]

Distr in the Torrey Range. Not uncommon near the larger cities in the area.

Time of Fl. Apr-Aug; May 20-Jun at Cornell.

Origin. Natzd from Eu.

Remarks. Often a troublesome weed of grainfields; more abundant northw.

The young leaves are edible, tasting somewhat mustard-like, with a suggestion of onion, and the seeds can be used as a mustard-like condiment. This plant was classified as an edible cress by Loudon in 1855 and was still cultivated as a vegetable in 1882, at least in China, according to E. Bretschneider. However, its unpleasant odor is likely to deter most people from experimenting with it.

This species was formerly an ingredient in the Mithridate confection, an elaborate preparation used as an antidote to poison, but it is no longer used in medicine.

Kingsbury (1964) reports that the seeds of this plant were undoubtedly responsible for reports of gastric distress in livestock upon ingestion of grain containing quantities of its seed. This species was also incriminated in the poisoning of a herd of heifers in Washington, the animals having obtained the weed in hay.

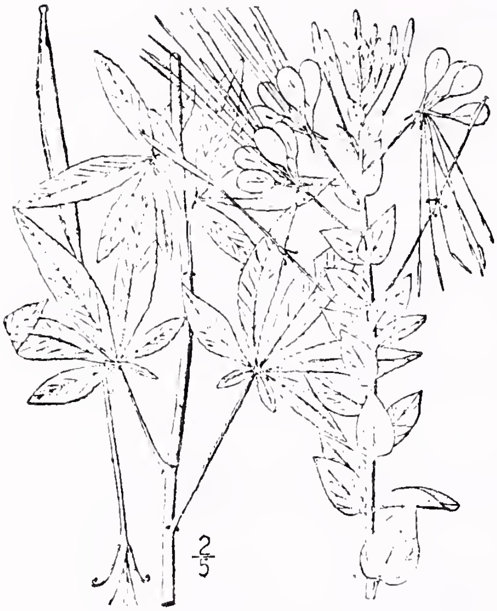
In areas where this species has become an undesirable weed, Muenscher (1952) suggests that surface cultivation in late autumn and early spring will help to bring it under control. Grainfields can be harrowed when the grain has reached a height of 3 to 4 inches. After the grain has been harvested, the stubble fields should be disked or harrowed to induce seed germination and to destroy the young seedlings.

CAPPARIDÀCEAE, the Caper Family

This is primarily a tropical family comprising about 45 genera and 900 species, our plants consisting of annual herbs with alternate compound leaves and terminal bracteate racemes; most tropical genera are made up of trees and shrubs. Lawrence (1951) observes that "Phylogenists are agreed that the Capparidaceae and Cruciferae are 2 closely related families, and evidence seems to indicate that either each has been derived from a common ancestor, or that the Cruciferae may have arisen from a primitive member of the Capparidaceae." Capers, the unexpanded flower buds of Capparis spinosa, a trailing shrub of the Mediterranean region, are cultivated in Sicily and the south of France and pickled for use as a flavoring agent. A number of species are also cultivated for ornament.

Cleòme L. Cleome.

There are about 200 species of Cleome, mostly natives of the tropics in both hemispheres, although some species also occur in the western states. The name of the genus is the ancient Latin name of some cruciferous plant. Our species are annual herbs with palmately compound leaves and handsome flowers.



Cleome spinosa--Spider-flower
[From Britton & Brown (1913), Vol. II, p. 197.]

Cleòme spinòsa Jacq. Spider-flower.

Meaning of Species Name. Spiny.

Other Names. Prickly Cleome, Giant Spider-flower.

Type of Plant. An annual, viscid-pubescent, strong-scented herb, reproducing by seeds.

Habitat. Waste ground and damp or alluvial soil.

Range. S NY to Ill, Ark, and Mo, s to Fla and La; occasionally adv elsewhere.

Distr in NYS. Occasional as a waif about cities and along railroads in the w part of the state.

Distr in the Torrey Range. Not very common as an adv near the larger cities.

Time of Fl. Jun-Oct.

Origin. Trop Am; esc from cult in our reg.

REJECINDAE

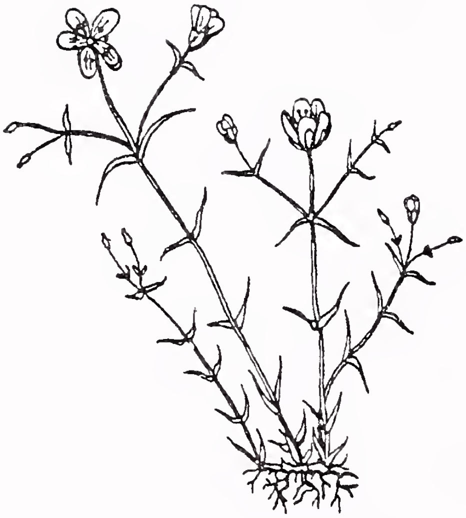
The botany office at the New York State Museum has for years maintained for each of the counties making up New York State an informal, up-to-date checklist of all plants known to occur in the county. Admittedly, these checklists are not complete, in part because there has not been time to check all herbaria where specimens from the state have been filed and in part because botanical exploration constantly turns up species previously unrecorded, but these lists do provide all the information currently available on what plants grow in each of the several counties of the state.

As mentioned in the introduction to Section I, however, the Platt list of 1840 was used as one of the sources in compiling a checklist of the plants occurring in Delaware County, although none of the Platt specimens has survived and there is no evidence that the plants studied were confined to those collected in Delaware County. The Platt list, comprising 380 species, contains 36 species comprising this section of the Catskill flora, two of which have neither since been collected in Delaware County, nor are there any records of their occurrence elsewhere in the Catskill region:

Claytonia virginica
Delphinium consolida

These species are therefore rejected both from the checklist for Delaware County and as elements constituting part of the Catskill flora until such time as more specific evidence is found that they occur in this area.

ADDENDUM



Arenaria glabra--Smooth Sandwort
[From The Chirp, Vol. 27, No. 2, p. 13, March-April 1982.]

After camera copy for this volume had been prepared for the printer (but fortunately before it had actually been mailed to Albany), the following article, together with the above illustration, appeared in The Chirp, a bulletin of the John Burroughs Natural History Society, published at West Park, N. Y. 12493. This article was deemed of sufficient interest to quote in its entirety.

"MOUNTAIN SANDWORT--ICE AGE SURVIVOR

"You rarely hear good news about an endangered species, but one of Ulster County's rarest plants is not only surviving but actually spreading out and prospering.

"This delicate little wisp of a wildflower is called the mountain sandwort. It stands only a few inches tall, and when the tiny white flowers are gone the slender stem and leaves become almost invisible.

"The mountain sandwort is known to grow at just one place in the Catskills and at several more in the Shawangunk Mountains. In every location it shows itself to be a true alpine wildflower, always preferring rocky sites with thin soil and full exposure to the sun. Actually, 'prefer' is not quite the right word--the sandwort simply tolerates these difficult growing conditions better than most other species. As its scientific name suggests (arenaria groenlandica [sic; see p. 43 for the most recent interpretation of the nomenclatural status of this species]), the sandwort can even tolerate the alpine summits of the Adirondacks and the windswept wastes of Greenland.

(Continued on p. 274.)

LIST OF ABBREVIATIONS

The following abbreviations are used primarily in the "plant biographies" and in the Appendix, for the most part without periods:

adv, adventive
Afr, Africa, African
Ak, Alaska
Ala, Alabama
alt, altitude
Alta, Alberta
Am, America, American
Apr, April
Ariz, Arizona
Ark, Arkansas
Aug, August
Austr, Australia
BC, British Columbia
BW, black-and-white photograph
c, central
Cal, California
cm, centimeter
Co, county, counties
Col, Colorado
Ct, Connecticut
cu, cubic
cult, cultivation, cultivated
DC, District of Columbia
Dec, December
Del, Delaware
distr, distribution
dm, decimeter
e, east, eastern
eastw, eastward
esc, escape, escaped
estab, established
Eu, Europe
Feb, February
fl, flower, flowering
Fla, Florida
fr, fruit, fruiting
frag, fragmentary
ft, foot
Ga, Georgia
Gl, Greenland
I, island
Ia, Iowa
Id, Idaho
Ill, Illinois
in., inch
Ind, Indiana
introd, introduced
Jan, January
Jct, junction
Jul, July
Jun, June
Kan, Kansas
Ky, Kentucky
L, lake
La, Louisiana
Lab, Labrador
lb, pound
LI, Long Island
m, meter
Mack, Mackenzie District
Man, Manitoba
Mar, March
Mass, Massachusetts
Md, Maryland
Me, Maine
Mex, Mexico
Mich, Michigan
Minn, Minnesota
Miss, Mississippi
mm, millimeter
Mo, Missouri
Mont, Montana
Mt(s), Mount, mountains
n, north, northern
NAm, North America(n)
natzd, naturalized
NB, New Brunswick
NC, North Carolina
n.d., no date
ND, North Dakota
NE, New England
ne, northeast, northeastern
Neb, Nebraska
Nev, Nevada
Nf, Newfoundland
NH, New Hampshire
NJ, New Jersey
NM, New Mexico
n.n., no name
northw, northward
Nov, November
n.p., no place
NS, Nova Scotia
nw, Northwest, northwestern

NY, New York
NYC, New York City
NYS, New York State
O, Ohio, Ohio State University
Oct, October
Okla, Oklahoma
Ont, Ontario
Ore, Oregon
Pa, Pennsylvania
Phil, Philadelphia Academy of Sciences
Que, Quebec
R, river
reg, region, regions
RI, Rhode Island
Rt, route
s, south, southern
SAm, South America(n)
Sask, Saskatchewan
SC, South Carolina
SD, South Dakota
sec(s), section(s)
Sep, September
SI, Staten Island
southw, southward
southwestw, southwestward
ssp, subspecies
St, saint
sw, southwest, southwestern
T, transparency; i.e., a 35-mm slide in color
Tenn, Tennessee
Tex, Texas
Trop, tropics, tropical
US, United States
Va, Virginia
var., variety
vic, vicinity
Vt, Vermont
w, west, western
Wash, Washington
westw, westward
WI, West Indies
Wis, Wisconsin
wt, weight
WVa, West Virginia
Wyo, Wyoming
x, a cross between two species, indicating a hybrid
Yuk, Yukon Territory

GLOSSARY OF TECHNICAL TERMS

Unhappily for the amateur, botanical literature is so rife with technical terms that it almost seems necessary to learn a new language in order to be able to read some of it with any degree of comprehension. The writer has tried (but probably not always succeeded very well) not only to keep the use of technical terms to a minimum but also to define those he does use when they first occur. Since glossaries of botanical terms are readily available in most of the field guides, to say nothing of the two more comprehensive ones given in Fernald (1950) and in Gleason (1952), the writer has made no attempt to compile a glossary of botanical terms for this work. In any case, recourse can always be had to Webster's Seventh New Collegiate Dictionary (1965), where most of them are defined. Should one wish to go further afield, George Usher's (1966) A Dictionary of Botany is an excellent reference.

This work contains many references to the medicinal applications of plants, in the course of which the use of a number of medical terms has been necessary. Such words are perhaps likely to be even more unfamiliar to the layman than are those relating more or less strictly to botany. While the definitions of most of the medical terms are likewise given in the dictionary, the following list, compiled in part from Krochmal *et al*. (1971), may be helpful.

Ague, an old word for fever, usually malaria.
Allergenic, produces an allergy.
Alterative, an old-fashioned medical term meaning a medicine that cures an illness by gradually restoring general bodily health.
Amenorrhea, an abnormal absence or suppression of the menstrual discharge.
Anodyne, relieves or quiets pain.
Antacid, neutralizes excess acidity in the alimentary canal.
Anthelmintic, capable of expelling or destroying intestinal worms.
Antiasthmatic, relaxes bronchial muscles and relieves labored breathing.
Antibiotic, an organic chemical substance, derived from living things, that will work selectively against harmful microorganisms.
Antidote, counteracts the action of a poison.
Antipruritic, prevents or relieves itching (antipsoriatic).
Antipyretic, any medicine for checking or preventing fever; also called "febrifuge" and "refrigerant."
Antiscorbutic, a food or medicine that can prevent or cure scurvy; any plant that contains significant amounts of vitamin C is an antiscorbutic.
Antiseptic, checks or inhibits the growth of the microorganisms that cause infection.
Antitussive, relieves or prevents coughing.
Aperient, a mild and gentle-acting laxative.
Aromatic, a plant, drug, or medicine with a spicy scent and pungent but pleasing taste.
Astringent, causes the contraction or shrinkage of body tissues.
Ataxia, an inability to coordinate voluntary muscular movements.
Calculous, a mineral deposit or "stone," usually in the bladder or kidney.
Carcinogenic, causing cancer.
Carminative, used to discourage the formation of gas after eating.

Catarrhal, related to inflammation of the respiratory tract.
Cathartic, causes an evacuation of the bowel.
Caustic, destroys tissue.
Cholagogue, increases the flow of bile.
Consumption, an old term for tuberculosis.
Corroborant, an invigorating agent.
Counterirritant, causes irritation of the surface of an area with the object of relieving a deep-seated congestion.
Cystic, relating to the urinary bladder or to the gall bladder.
Cystitis, inflammation of the urinary tract.
Cytotoxic, poisonous to cells.
Decoction, an extract obtained by boiling.
Demulcent, a substance used to protect or soothe the gastro-intestinal tract.
Deobstruent, a medicine that has the power to clear obstructions from the natural ducts of the body.
Depurative, removes impurities and waste materials from the blood.
Diaphoretic, used to increase perspiration.
Disinfectant, destroys or inhibits the growth of harmful microorganisms.
Diuretic, increases the volume and flow of urine.
Drastic, an agent that acts rapidly or violently.
Dropsy, edema, an abnormal accumulation of serous fluid in bodily tissues (excess "water" in the common tongue).
Dysentery, a disease characterized by severe diarrhea with passage of mucus and blood, usually caused by infection.
Dyspepsia, a disturbed digestive condition characterized by nausea, gas, and heartburn; indigestion.
Emetic, an agent that causes vomiting.
Emmenagogue, an agent that induces menstrual flow.
Emollient, used externally to soothe or soften the skin and protect it.
Excoriation, a peeling or wearing off of the skin.
Expectorant, an agent that causes expulsion of phlegm from the respiratory tract.
Febrifuge, an agent that reduces fever.
Flatulence, stomach discomfort caused by gas.
Flux, an excessive abnormal discharge from the bowels.
Gastritis, inflammation of the mucous membrane, particularly of the stomach.
Hemoptysis, expectoration of blood from some part of the respiratory tract.
Hemorrhage, a copious discharge of blood from the blood vessels; bleeding.
Hemostatic, an agent used to stop internal hemorrhage.
Hepatic, of or pertaining to the liver.
Herpetic, pertaining to reptiles.
Hygroscopic, having the ability to attract and absorb moisture from the surrounding environment.
Hypnotic, an agent that induces sleep without delirium.
Infusion, an extract obtained by steeping or soaking in water, usually hot but not boiling.
Irritant, causes inflammation of, or stimulation to, the tissues.
Jaundice, a diseased condition that causes the skin, eyes, and body fluids to turn a yellowish-green color.
Lumbago, painful muscular rheumatism usually involving the lower back.
Menorrhagia, an abnormally profuse menstrual flow.
Nephritis, inflammation of the kidneys.

Nervine, a medicine that will quiet nervousness or act as a tonic to nerve tissue; a relaxant or calmative.

Ophthalmiatric, used in the treatment of eye diseases.

Pectoral, usually an expectorant, used for diseases of the chest and lungs.

Peritonitis, inflammation of the tissues lining the abdominal cavity.

Poultice, a soft, usually heated, medicinal substance spread on cloth and applied to the skin.

Pressor, raising or tending to raise blood pressure.

Pulmonary, pertaining to the lungs.

Purgative, increases peristalsis (contraction of the bowel).

Pustulant, causes severe irritation of the skin, especially the sweat glands.

Refrigerant, allays thirst and gives a sensation of coolness to the body.

Rheumatism, a sort of catch-all term that includes almost any pain and stiffness of the joints.

Rickets, a childhood disease characterized by defective deposition and utilization of calcium and phosphorus owing to inadequate sunlight or vitamin D.

Rubifacient, causes reddening and mild irritation of the skin.

Scorbutic, relating to or resembling scurvy.

Scurvy, a disease marked by swollen and bleeding gums, loosening of teeth, and bleeding into the skin and mucous membranes, resulting from a lack of ascorbic acid (vitamin C).

Sialagogue, causes an increase in flow of saliva.

Somnifacient, produces sleep without delirium; a soporific.

Soporific, tending to induce sleep.

Stimulant, a substance that increases the activity of some part of the body, but not all stimulants bring a feeling of well-being; stumulants must be carefully distinguished from narcotics, which often bring a feeling of euphoria by depressing certain nerve centers.

Stomachic, stimulates appetite and increases secretion of digestive juices.

Styptic, an agent to check or stop bleeding; most herbal styptics are strong astringents that staunch the flow of blood by shrinking the surrounding tissues, thus closing the exposed blood vessels.

Sudorific, increases perspiration.

Thoracic (pertaining to the chest), a medicine used to treat complaints of the lungs and bronchial tubes.

Tincture, a solution of a medicinal substance in alcohol.

Tonic, stimulates the restoration of strength or tone to the muscles; bitter tonics achieve this by stimulating the flow of gastric juices, which increases the appetite, enabling the patient to consume more nourishing food.

Urethritis, infection of the urethra, the duct by which urine is discharged from the bladder.

Vermicide, an agent that destroys worms.

Vermifuge, a substance used to destroy or expel parasitic intestinal worms.

Vesicant, causes irritation to the skin, resulting in blisters.

Vulnerary, an agent that promotes healing of open wounds.

(Continued from p. 268.)

"The sandwort was probably common in Ulster County several thousand years ago, when the continental ice sheet had just melted and the whole landscape resembled Greenland. But as the climate grew warmer and drier, the forest trees moved in on the accumulating soil, and the sandwort found fewer and fewer places to grow. Today the sandwort is a true glacial relic, a living reminder of the tremendous events that have shaped our landscape.

"The term 'rare and endangered' conjures up certain expectations, especially that the species be intolerant of human activity. It came as quite a surprise when members of the Trust staff twice came upon the mountain sandwort growing on raw earth left behind by a bulldozer. Our surprise, of course, says more about our expectations than about the sandwort. Delicate looking plants can be remarkably tough in their way, and the desolation left behind by a bulldozer may have much in common with the post-glacial landscape.

"One such place where the sandwort is advancing into new ground lies in Minnewaska State Park, where the Peterskill Road crosses over Fly Brook. If you visit it, please remember that it's still a protected plant despite its weedy surroundings. To pick it would be a crime as well as a shame."

The Mohonk Trust

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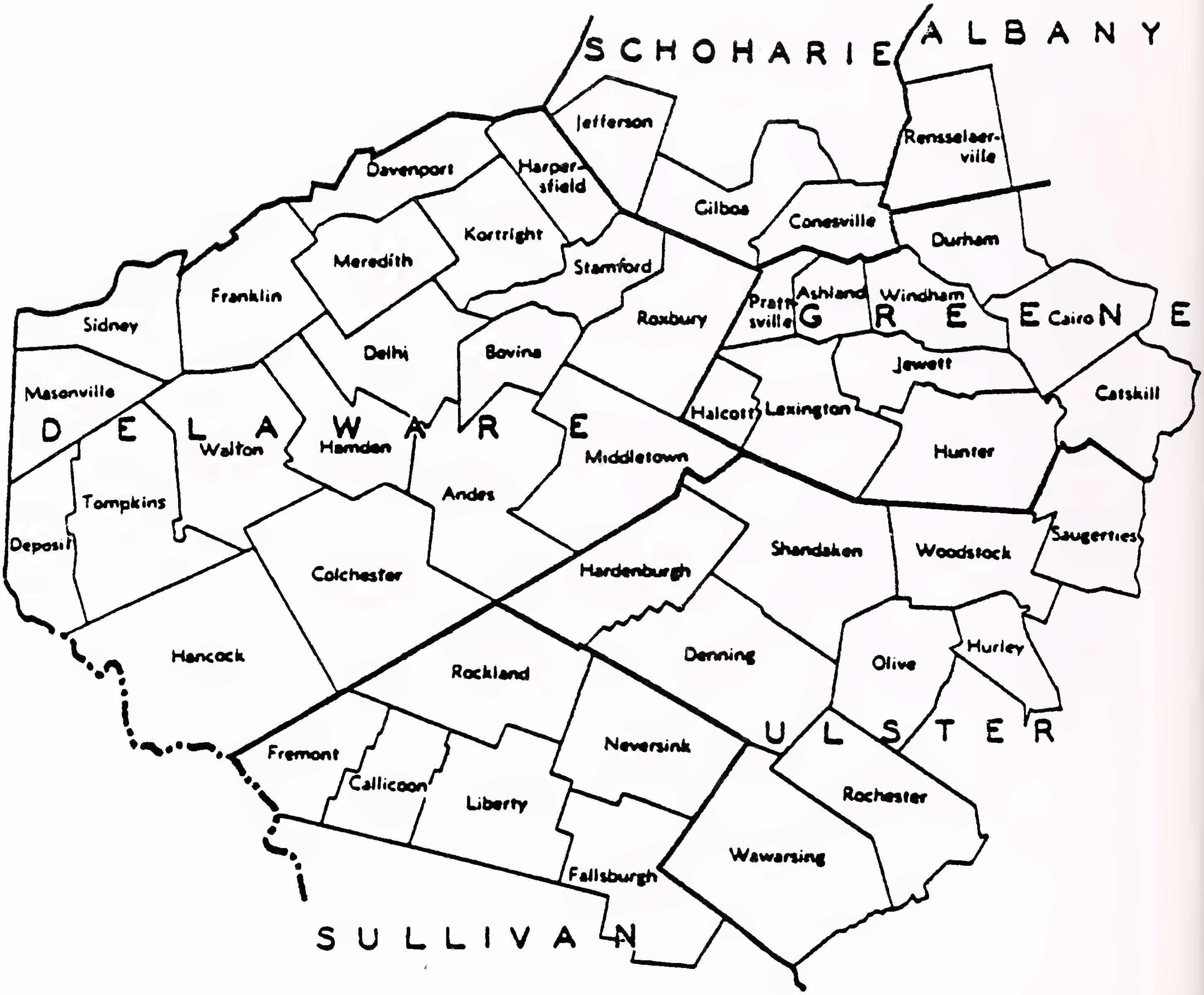
APPENDIX

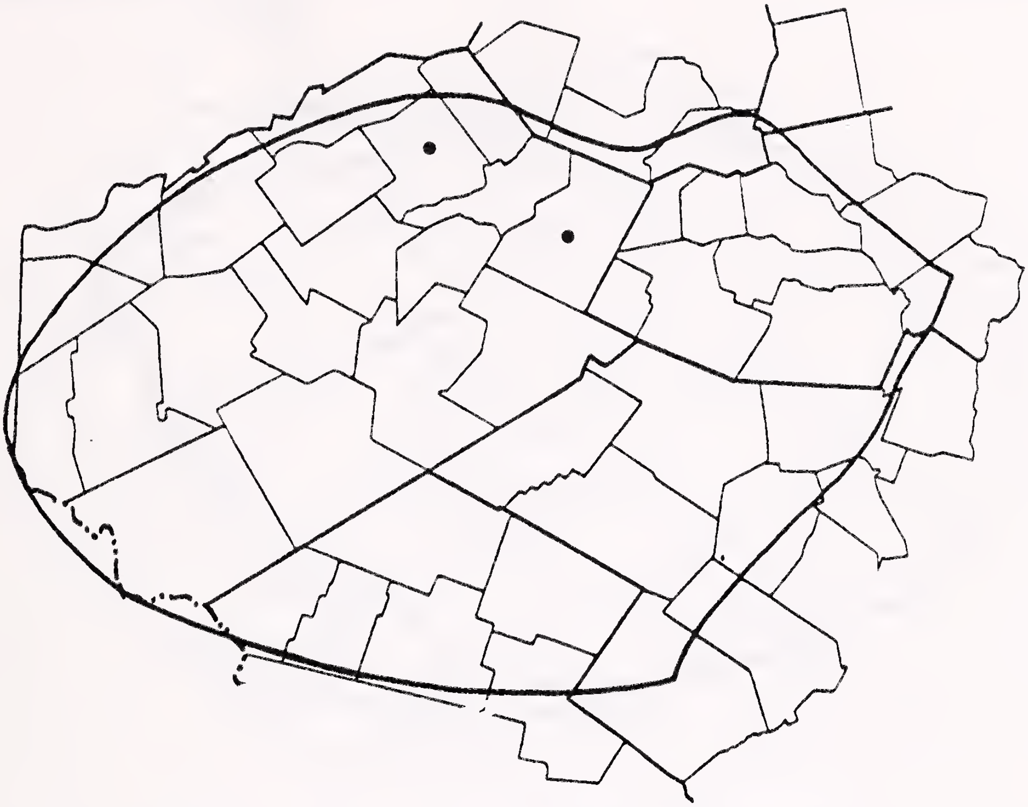
The first three sections of my Flora carried detailed documentation for each dot shown on the distribution maps for each species, whether they referred to actual collections made, a reference in the literature, a photograph taken by the writer, or to an observation made in the field. The end result was an Appendix that not only frequently overwhelmed the text but also greatly increased the length of each volume. Another factor to be considered is the fact that few people are likely to be interested in anything more than a general indication of the rarity of a given species or its overall distribution. Clearly a change in procedure seemed advisable. Few distribution maps found in the literature carry extensive documentation, yet that information represents countless hours of research in addition to much time spent in the field. In fact the writer has spent as much, if not more, time compiling distribution records and keeping them up to date as he has spent on research and writing the accompanying text. Such information should not be entirely thrown to the winds. It has therefore been decided to publish the distribution maps with the text but to file the documentation for those maps with the Botany Office of the New York State Museum, where they can be made available to the general inquirer upon request.

Families of plants in the data that follow are in general arranged in the order given in Fernald (1950) and in Gleason (1952), with the genera in alphabetical order followed by the species, also in alphabetical order. Following a device used by a number of other writers, the township grid has been used as the basis for the distribution maps that follow, where a solid dot (●) represents a collection made in that township, while an open circle (o) refers to an observation, a reference in the literature, or a photograph taken by the writer. No effort has been made to show the approximate location within the township of collections or observations; the solid dots and open circles simply indicate the occurrence of that taxon somewhere within the township.

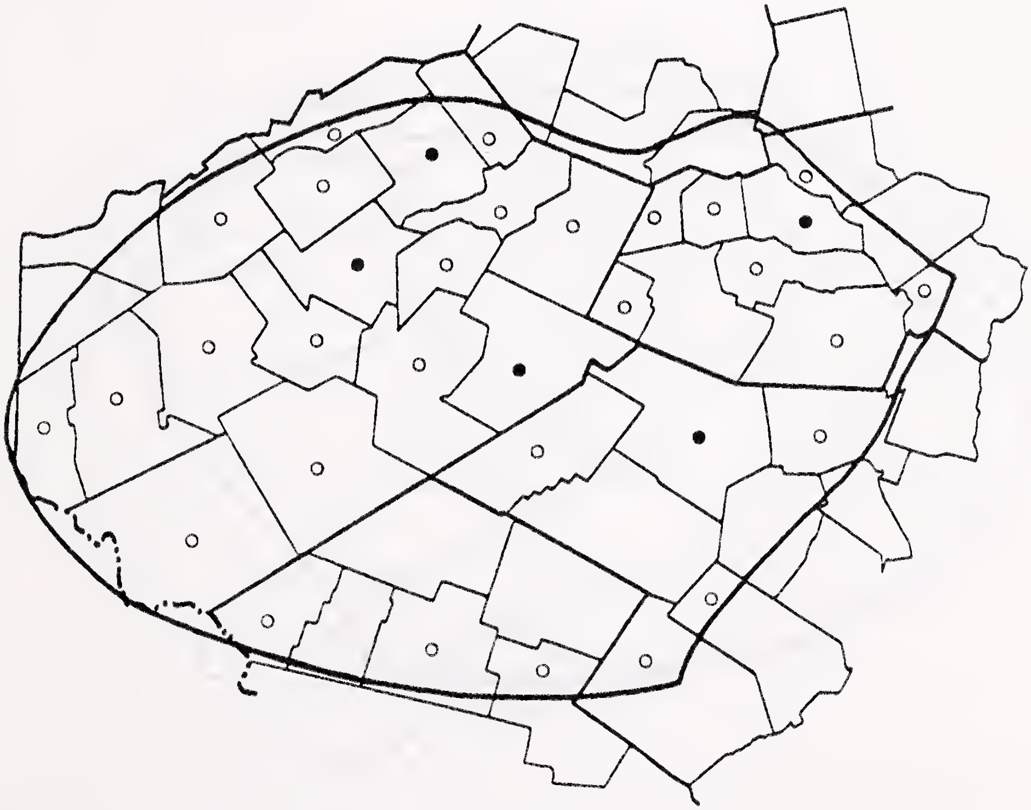


Counties and townships of the Catskill mountain region.

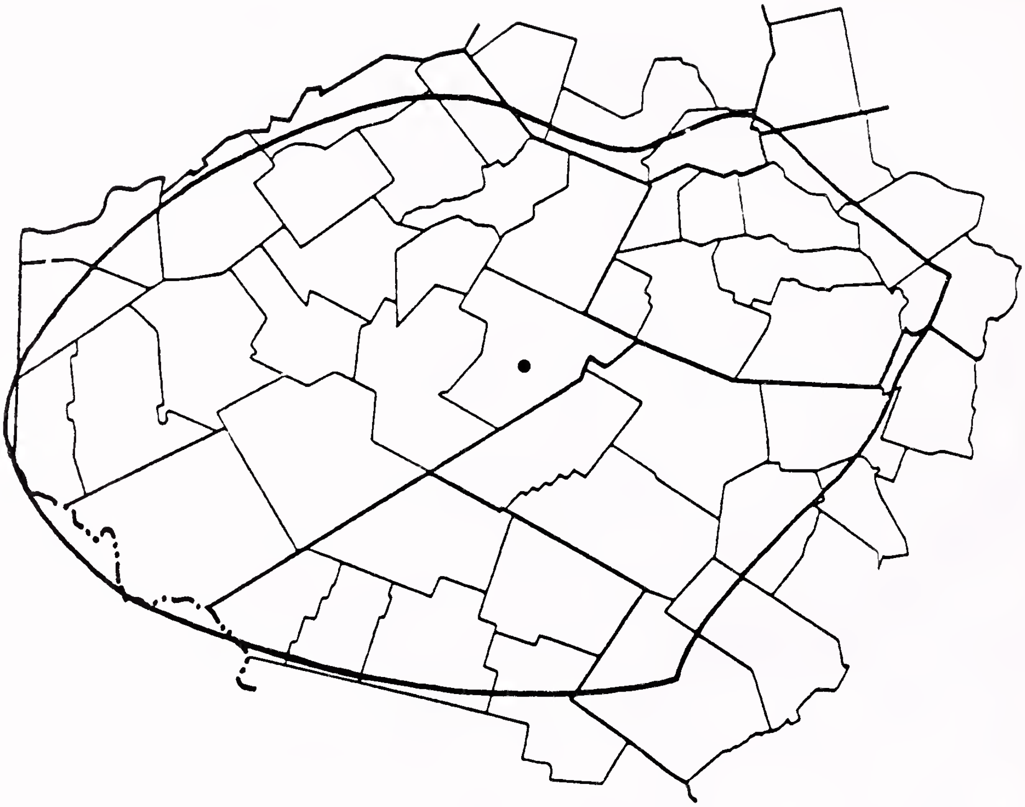
Atriplex patula L.
Orache



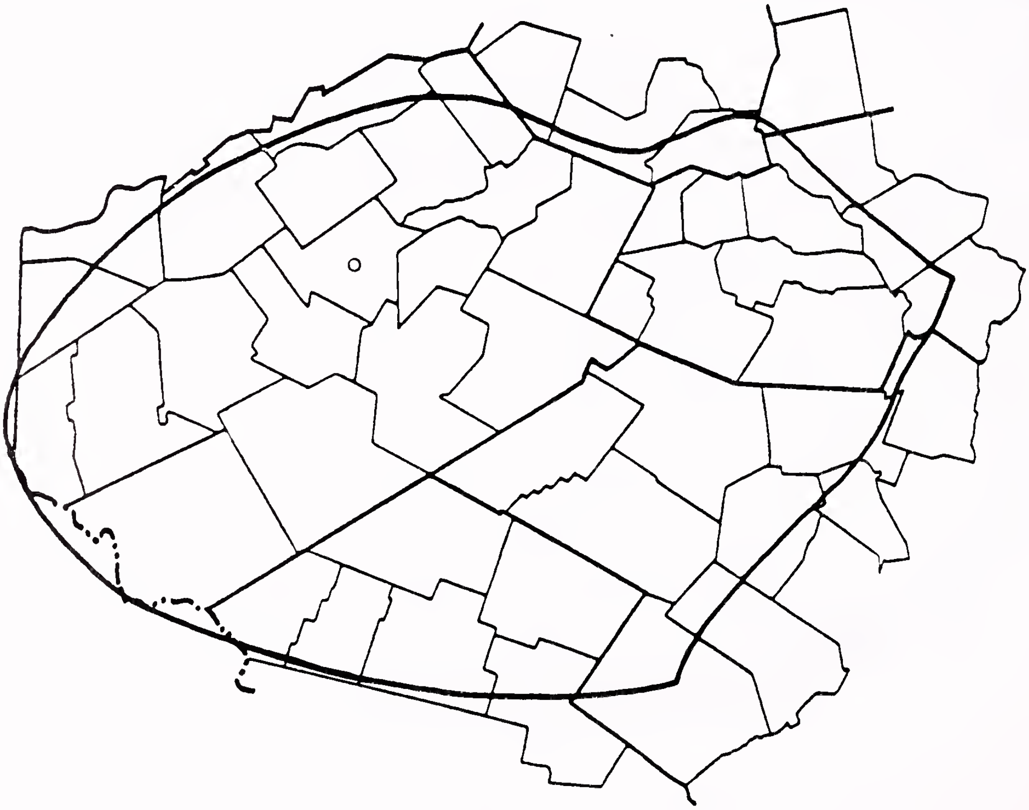
Chenopodium album L.
Lamb's-quarters



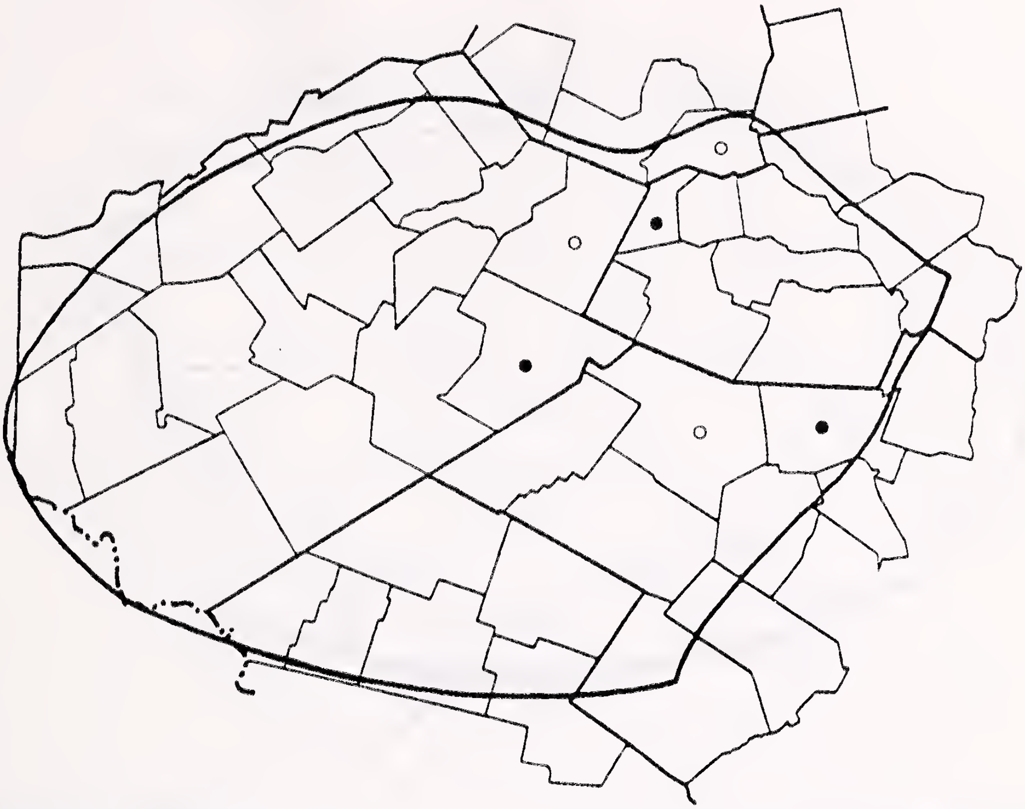
Chenopodium boscianum Moq.
Bosc's Goosefoot



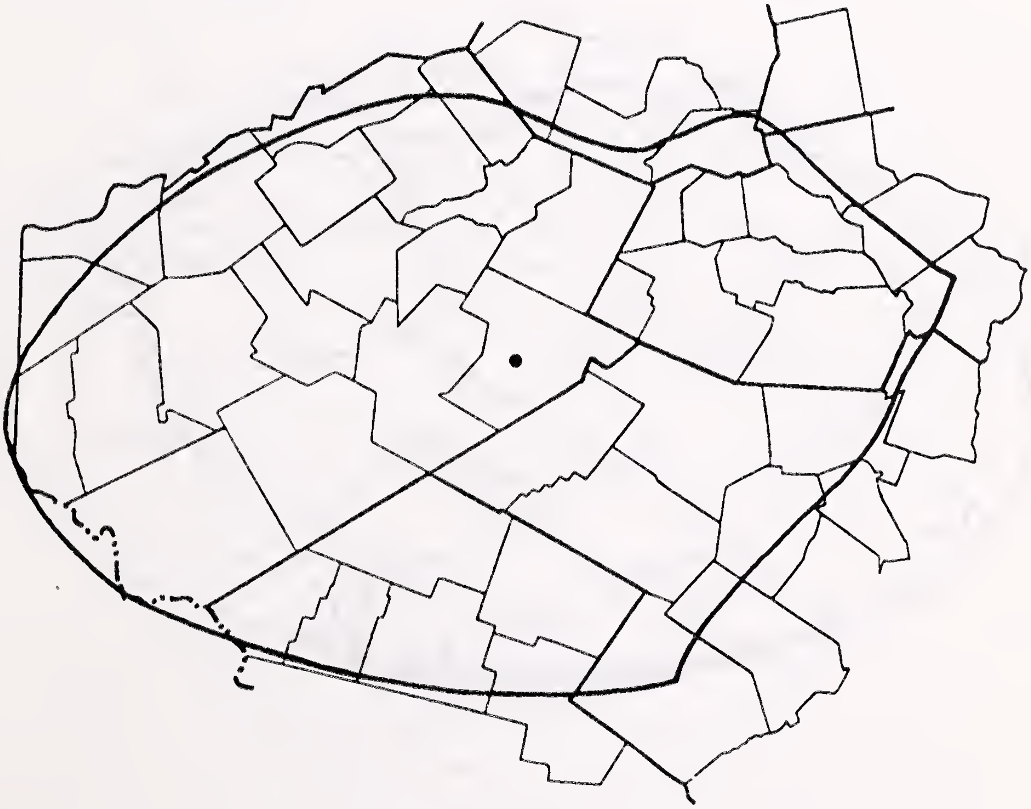
Chenopodium capitatum (L.) Aschers.
Strawberry-blite



Chenopodium hybridum L.
var. gigantospermum (Aellen) Rouleau
Maple-leaved Goosefoot

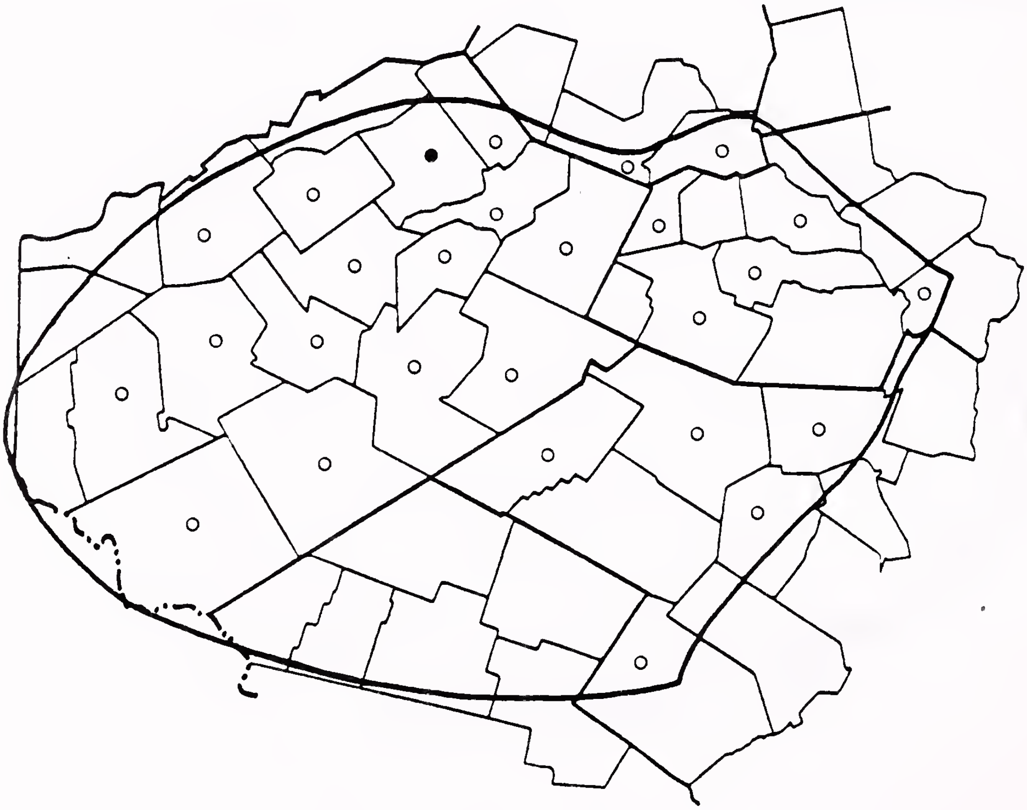


Chenopodium lanceolatum Muhl.
Narrow-leaved Goosefoot

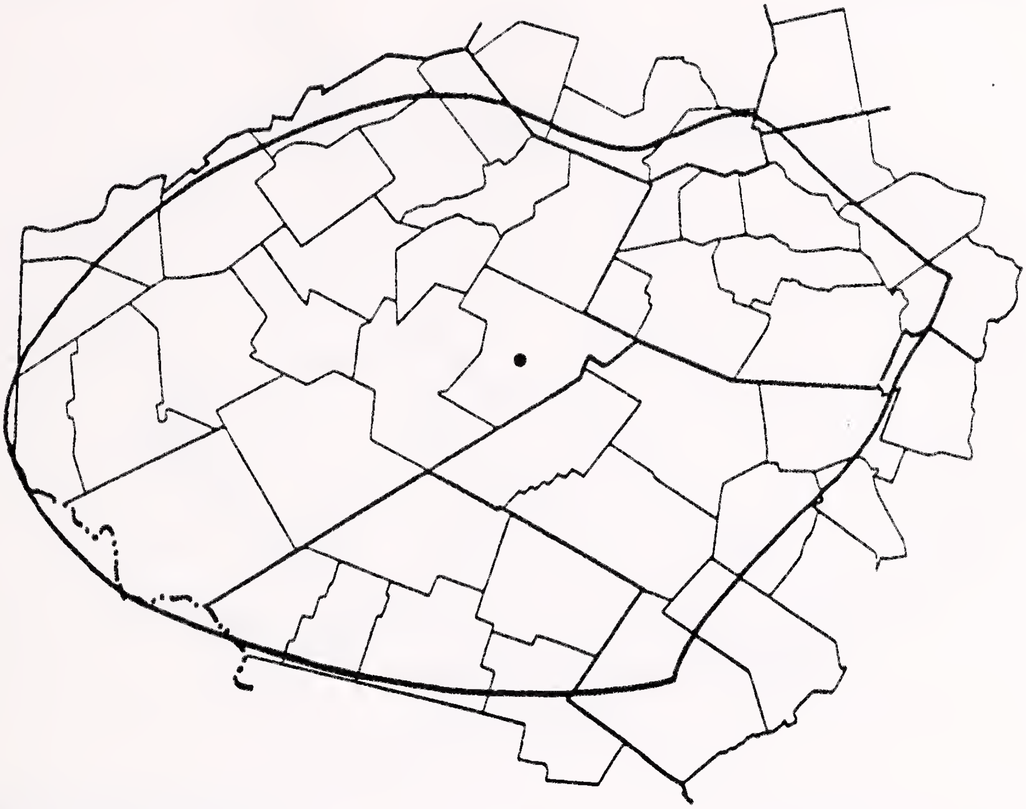


Chenopodium missouriense Aellen
Missouri Goosefoot

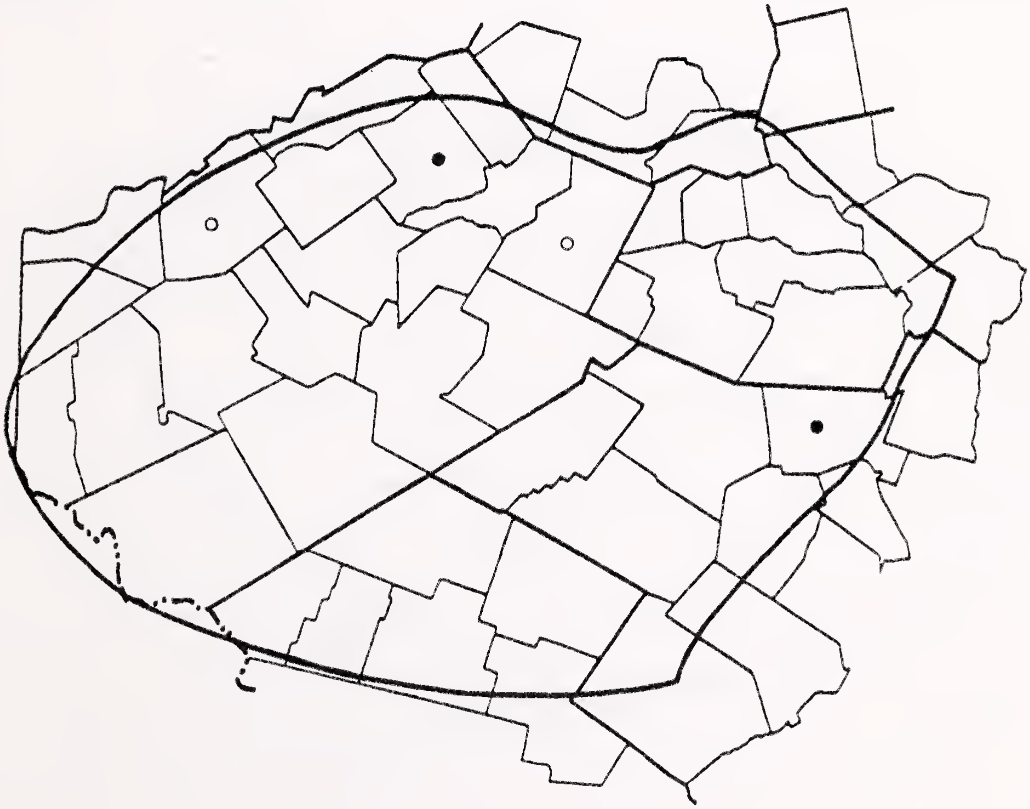
Chenopodium paganum Reichenb.
Bush's Goosefoot



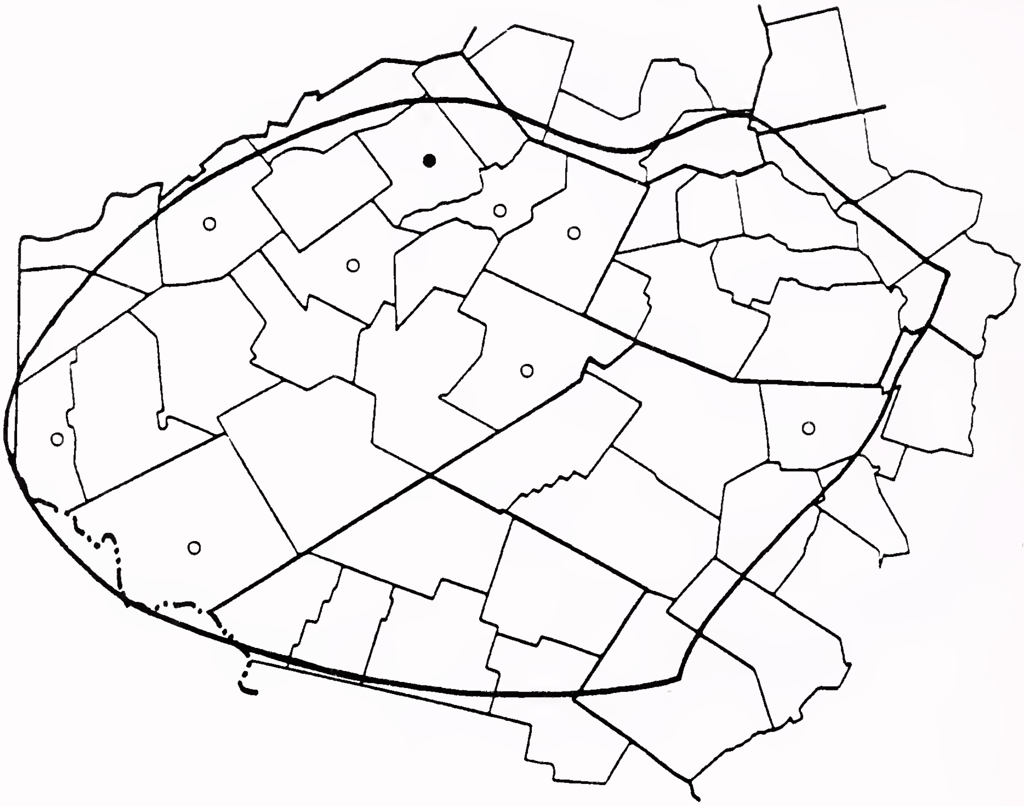
Kochia scoparia (L.) Roth
Kochia



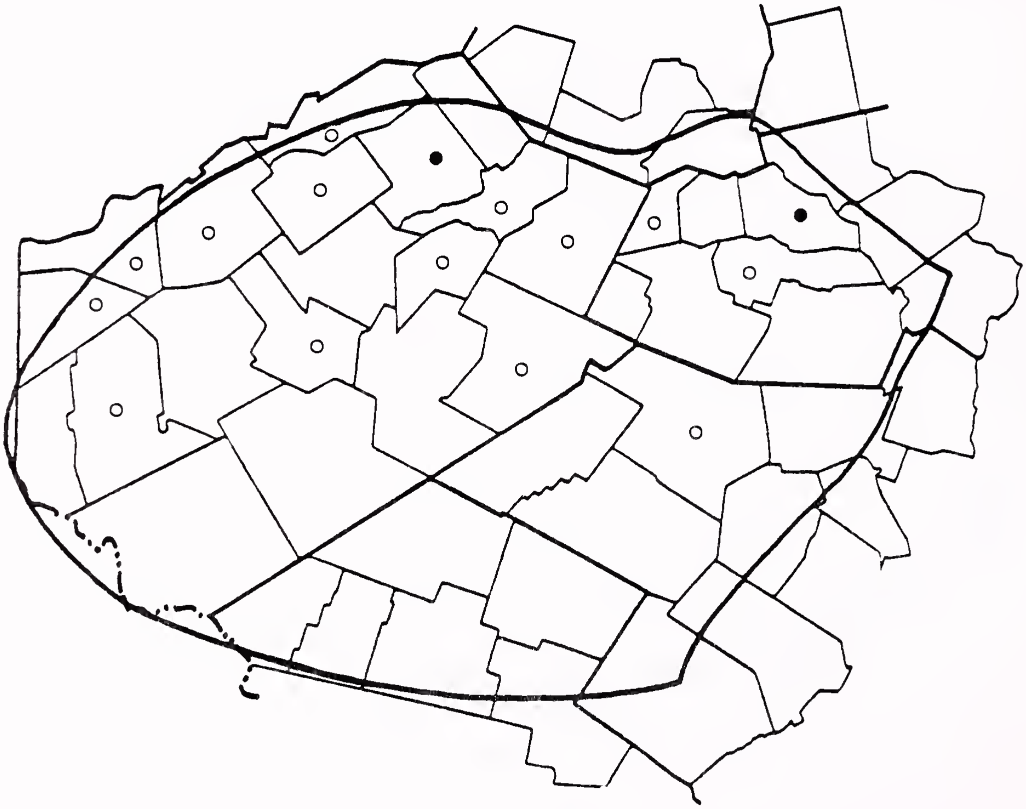
Amaranthus albus L.
Tumbleweed



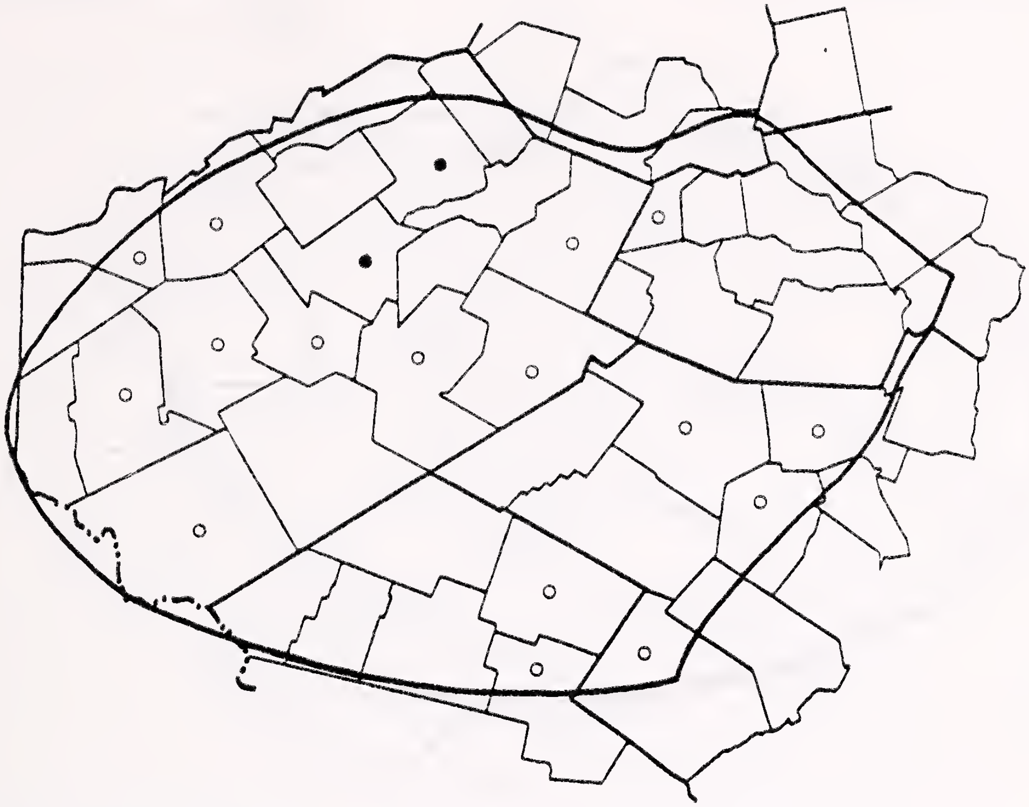
Amaranthus powellii S. Wats.
Powell's Amaranth



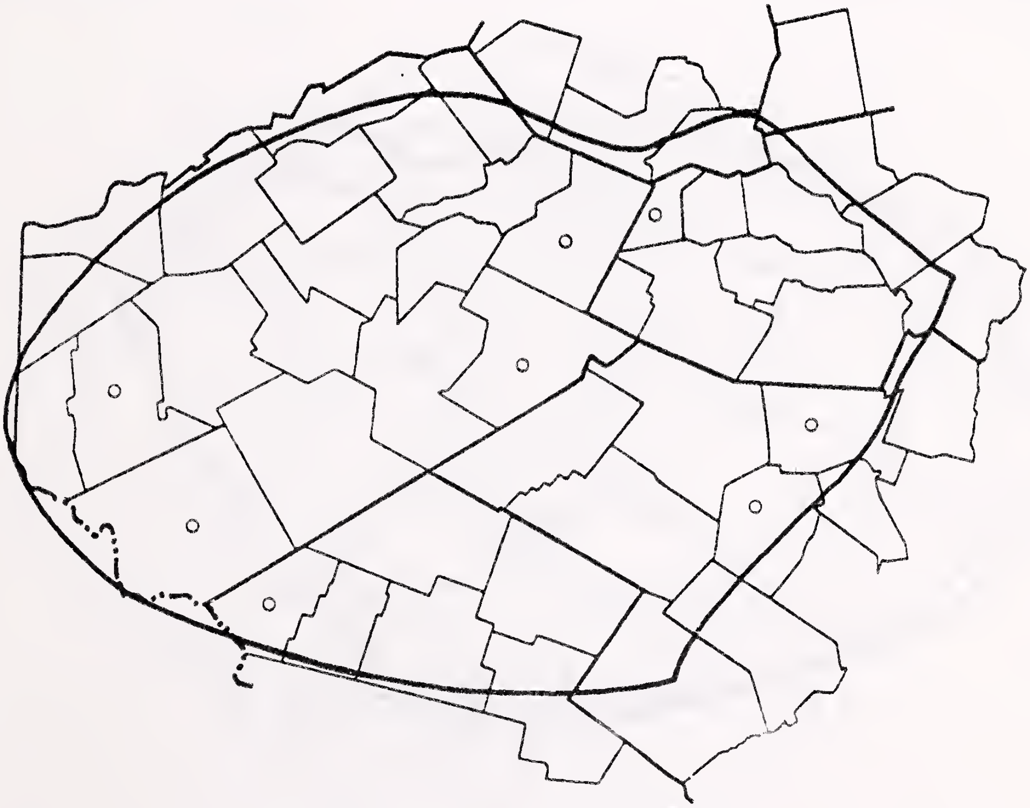
Amaranthus retroflexus L.
Red-rooted Amaranth



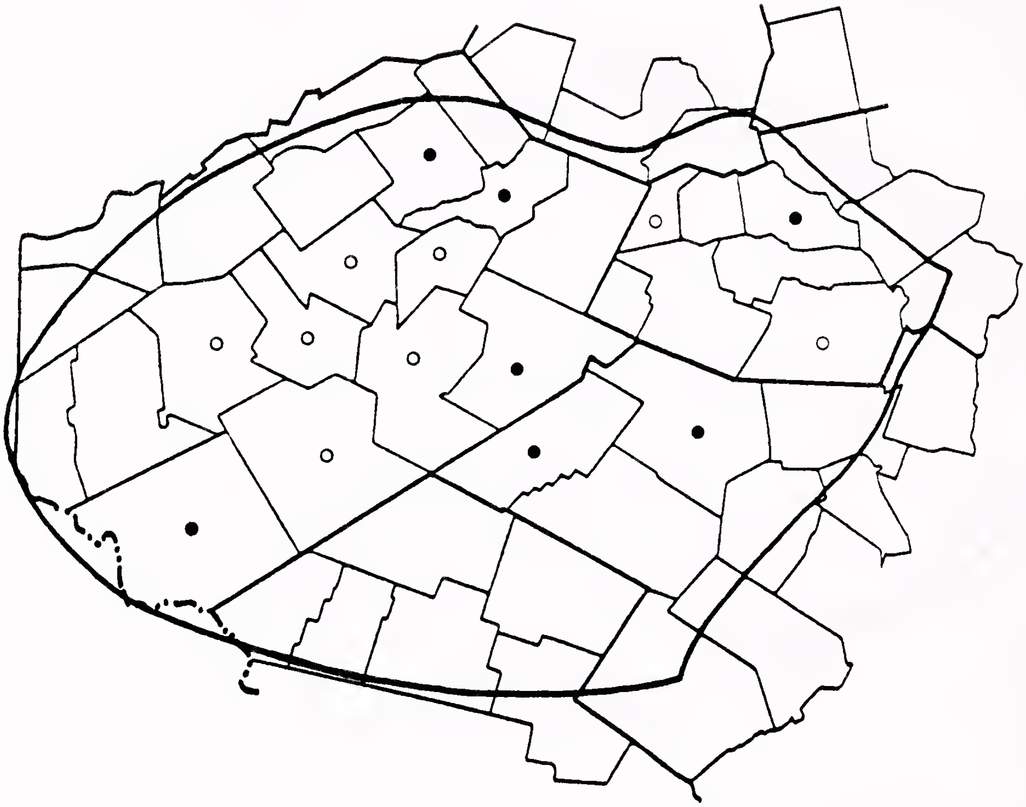
Phytolacca americana L.
Pokeweed



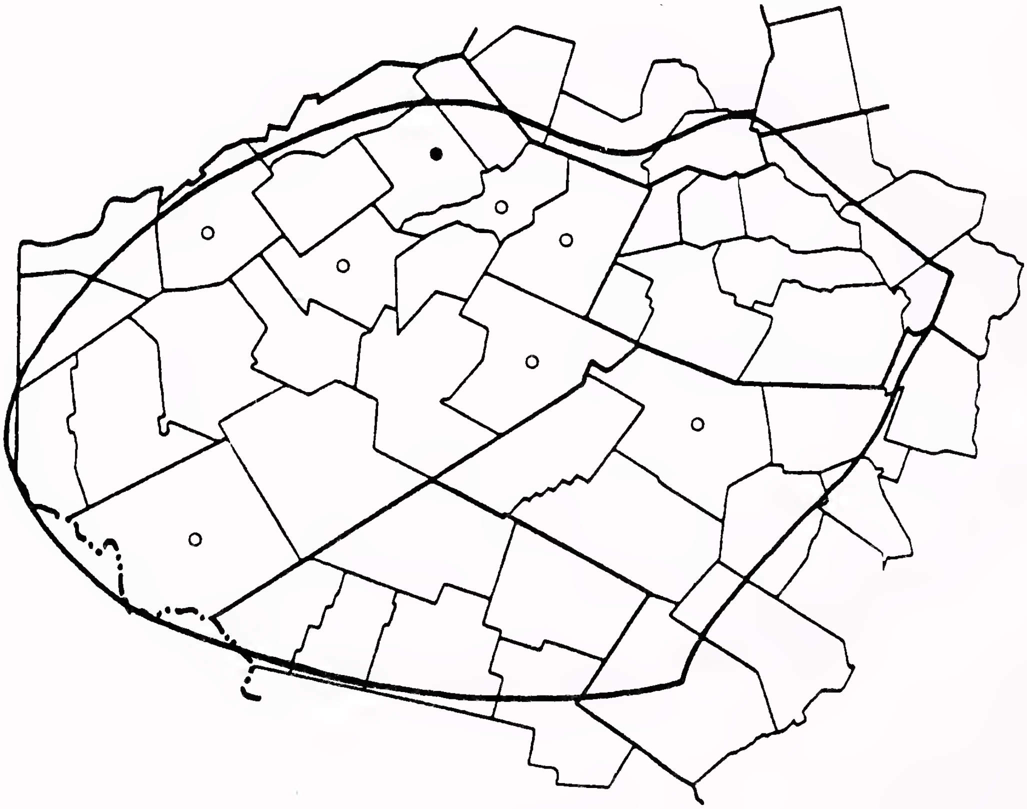
Mollugo verticillata L.
Carpetweed



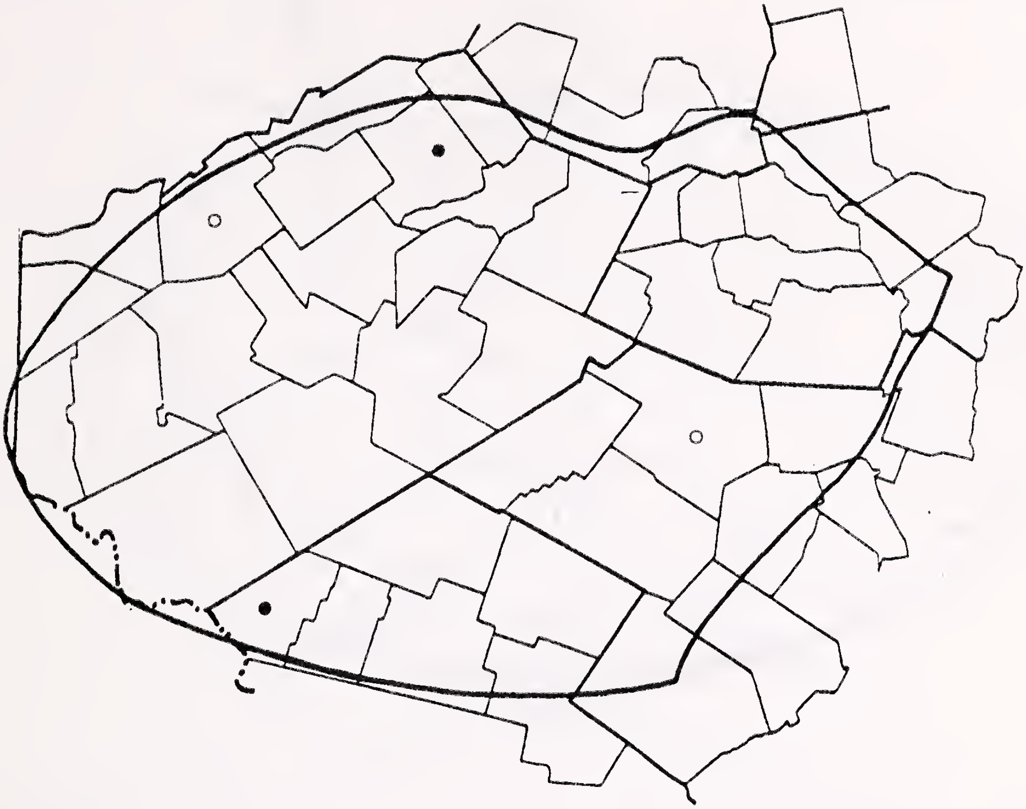
Claytonia caroliniana Michx.
Broad-leaved Spring Beauty



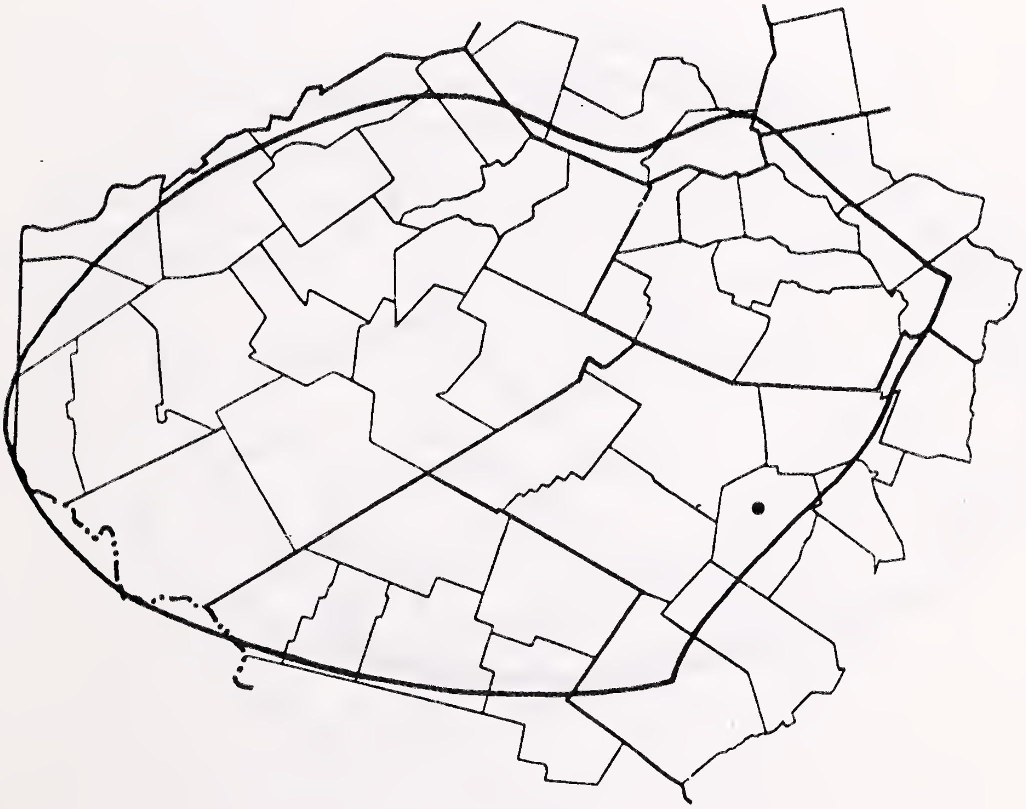
Portulaca oleracea L.
Purslane



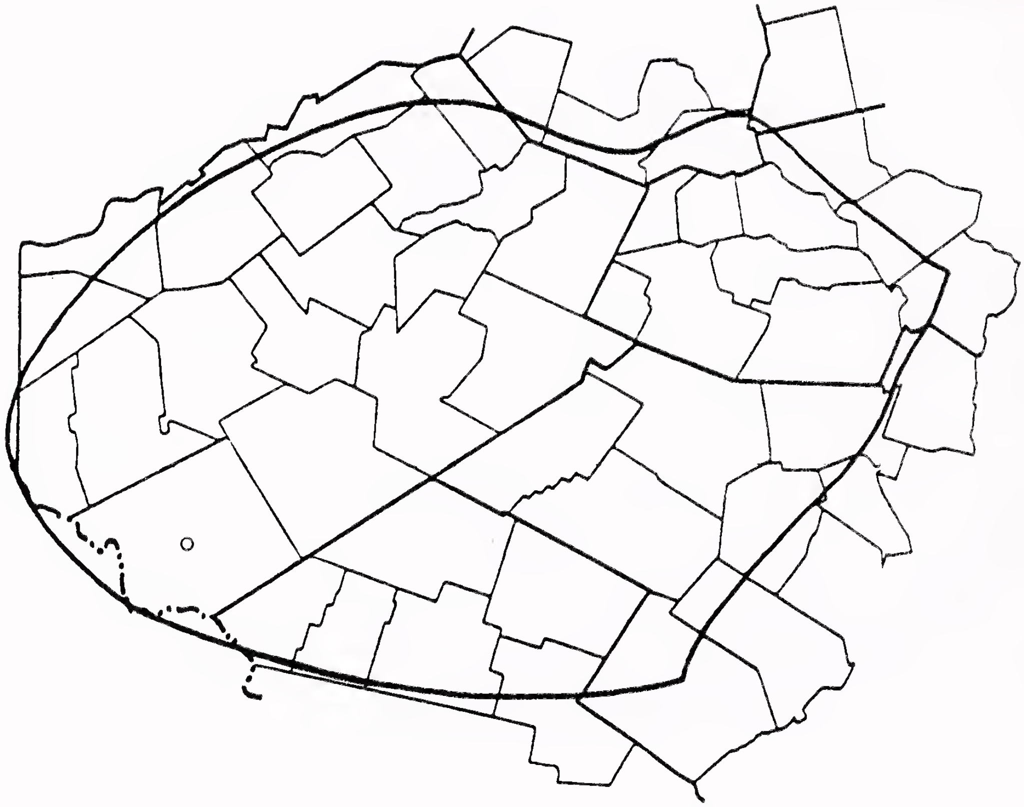
Agrostemma githago L.
Corn Cockle



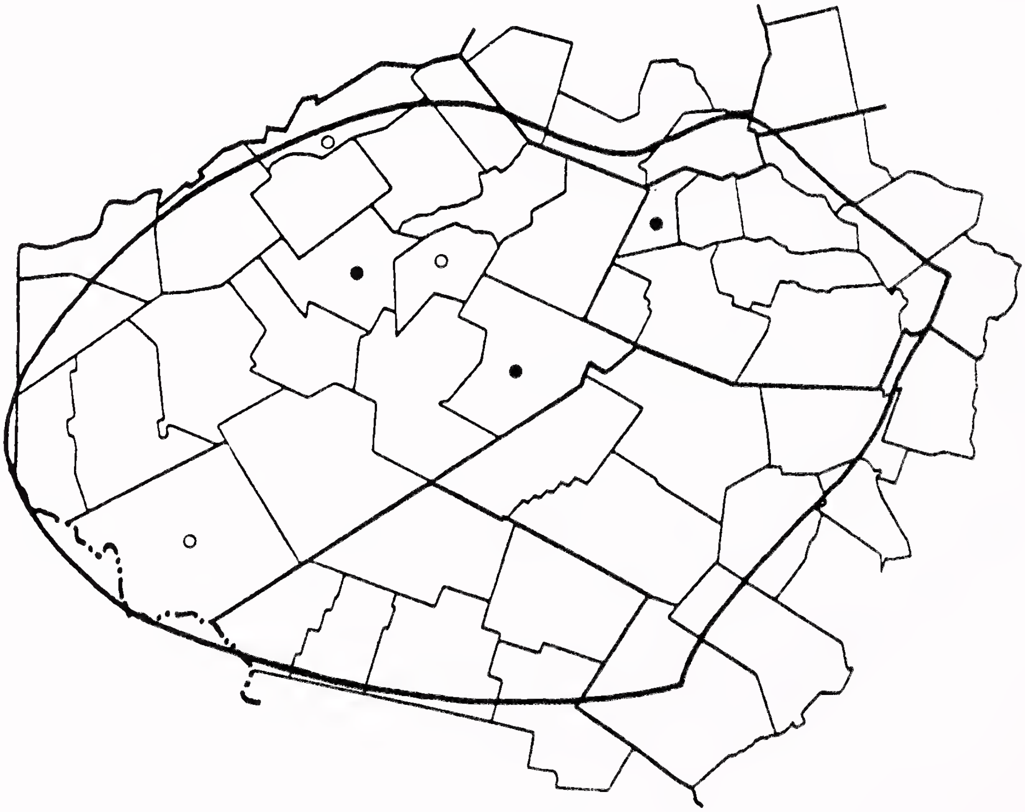
Arenaria glabra Michx.
Smooth Sandwort



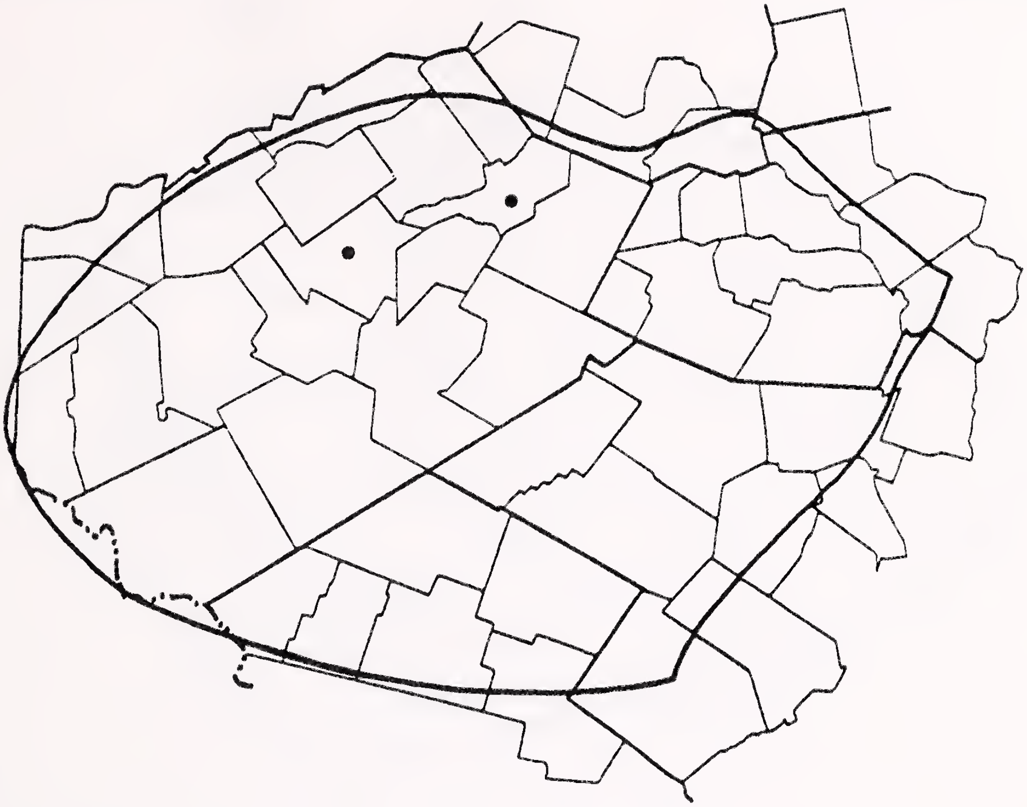
Arenaria lateriflora L.
Blunt-leaved Sandwort



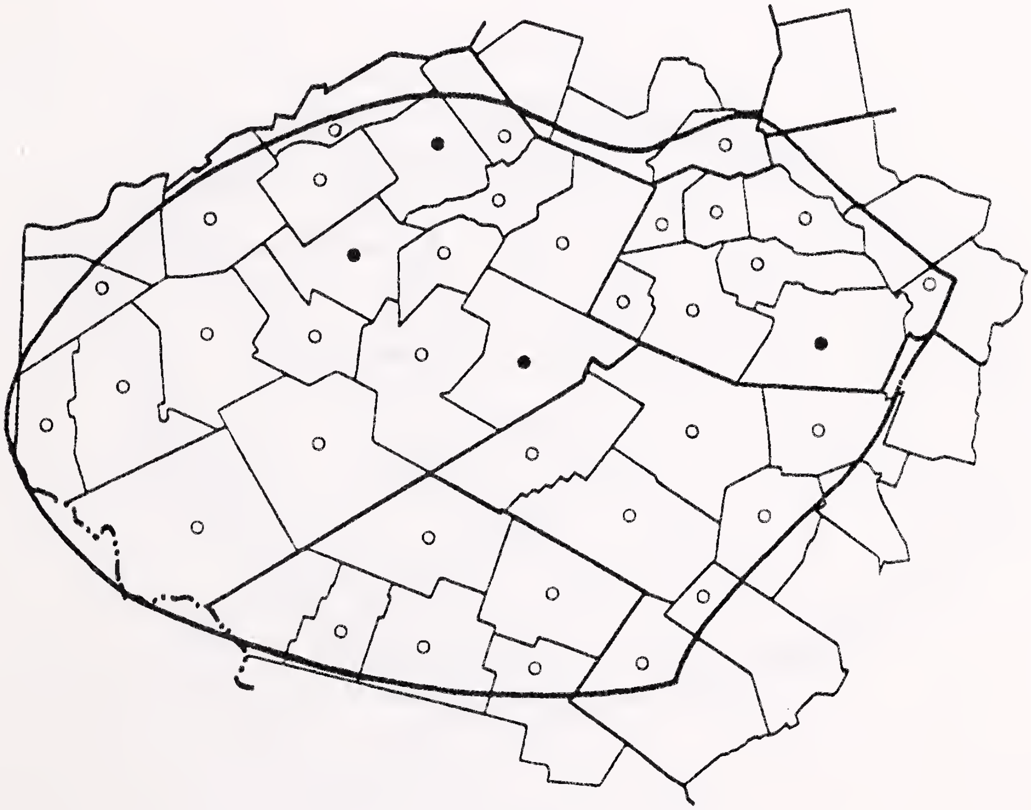
Arenaria serpyllifolia L.
Thyme-leaved Sandwort



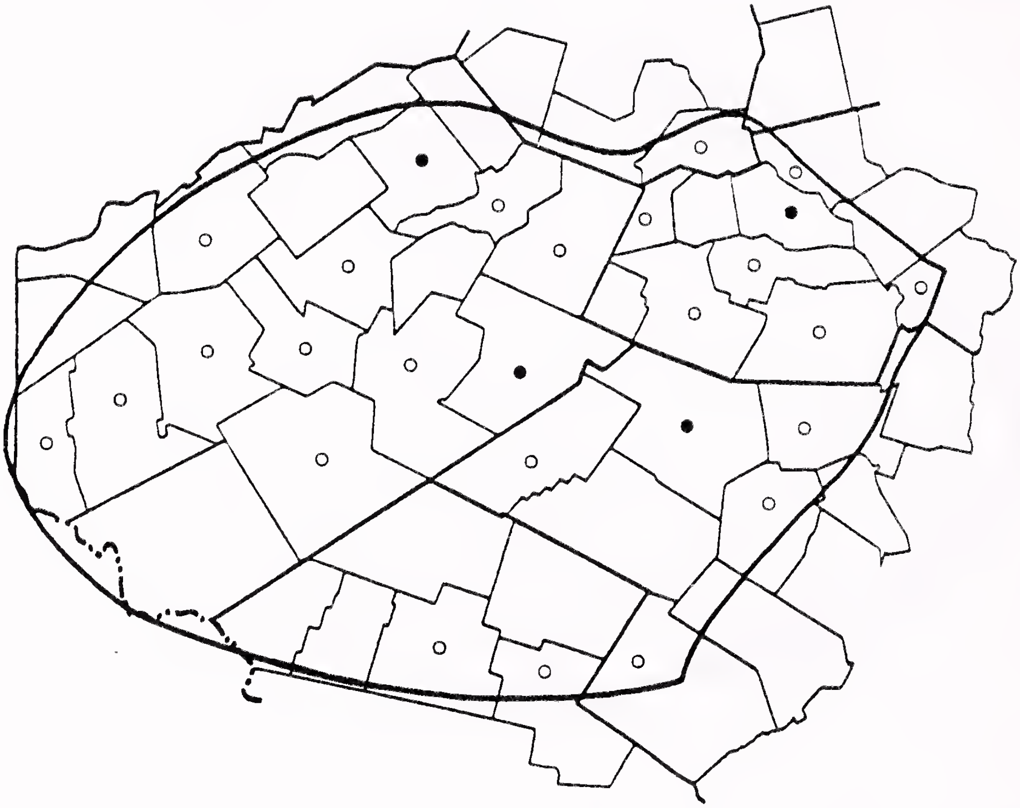
Cerastium arvense L.
Field Chickweed



Cerastium vulgatum L.
Mouse-eared Chickweed



Dianthus armeria L.
Deptford Pink



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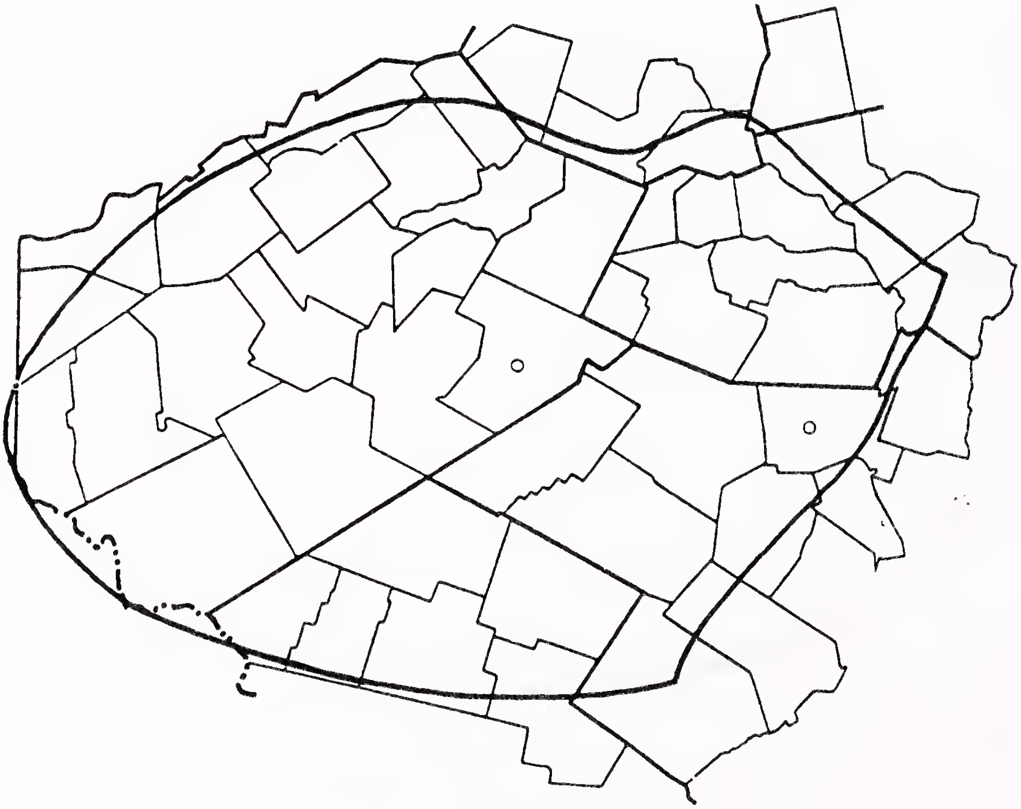

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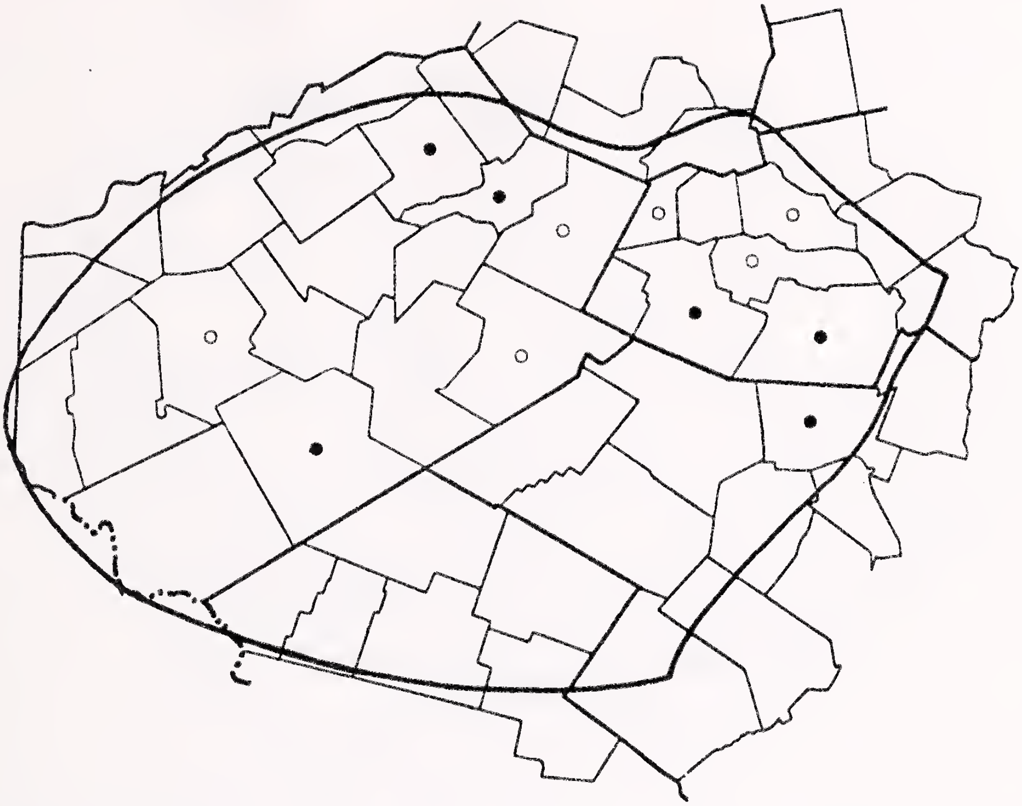
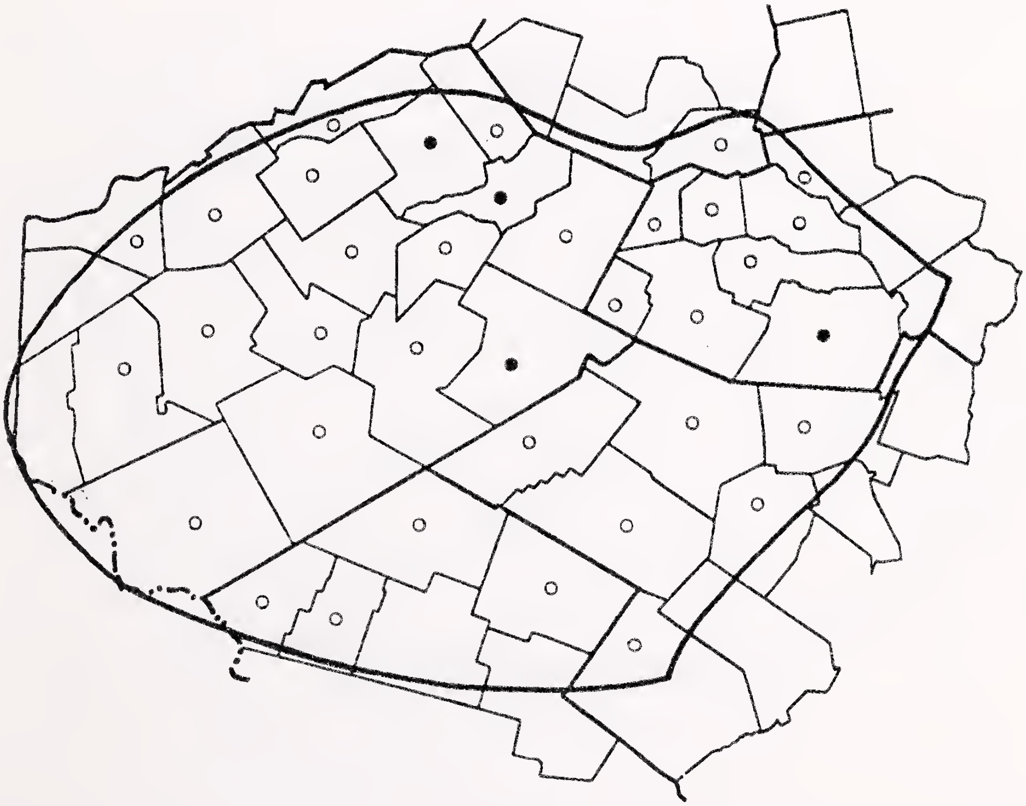


Lychnis alba Mill.
White Campion



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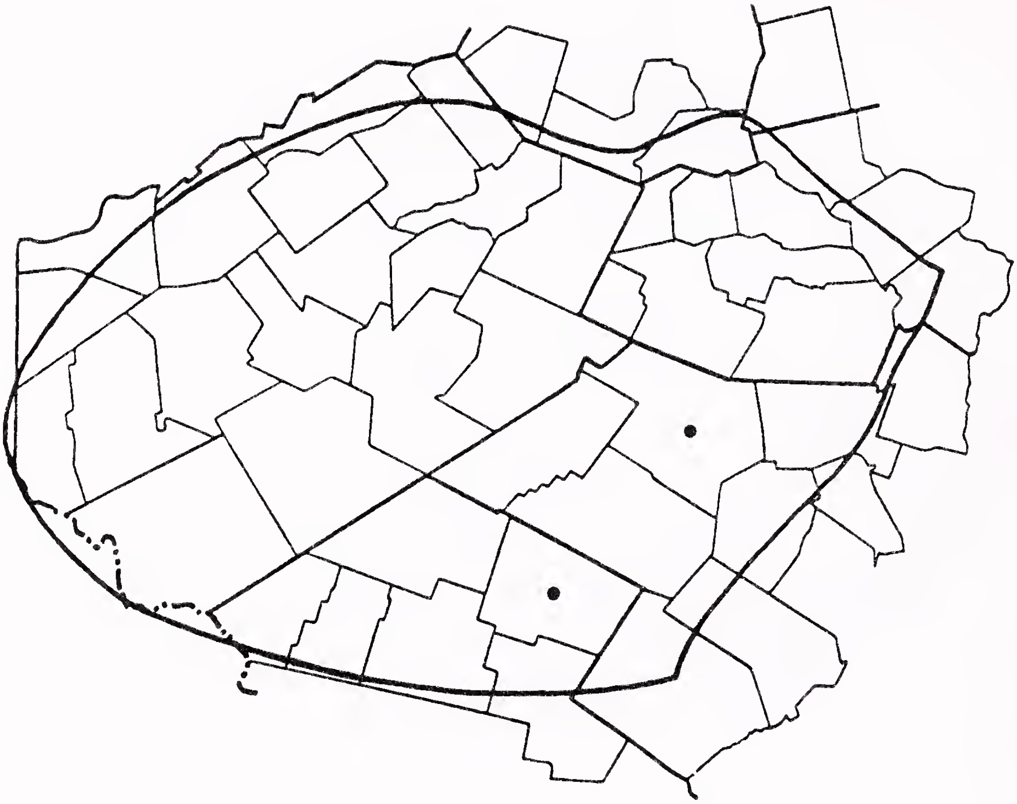
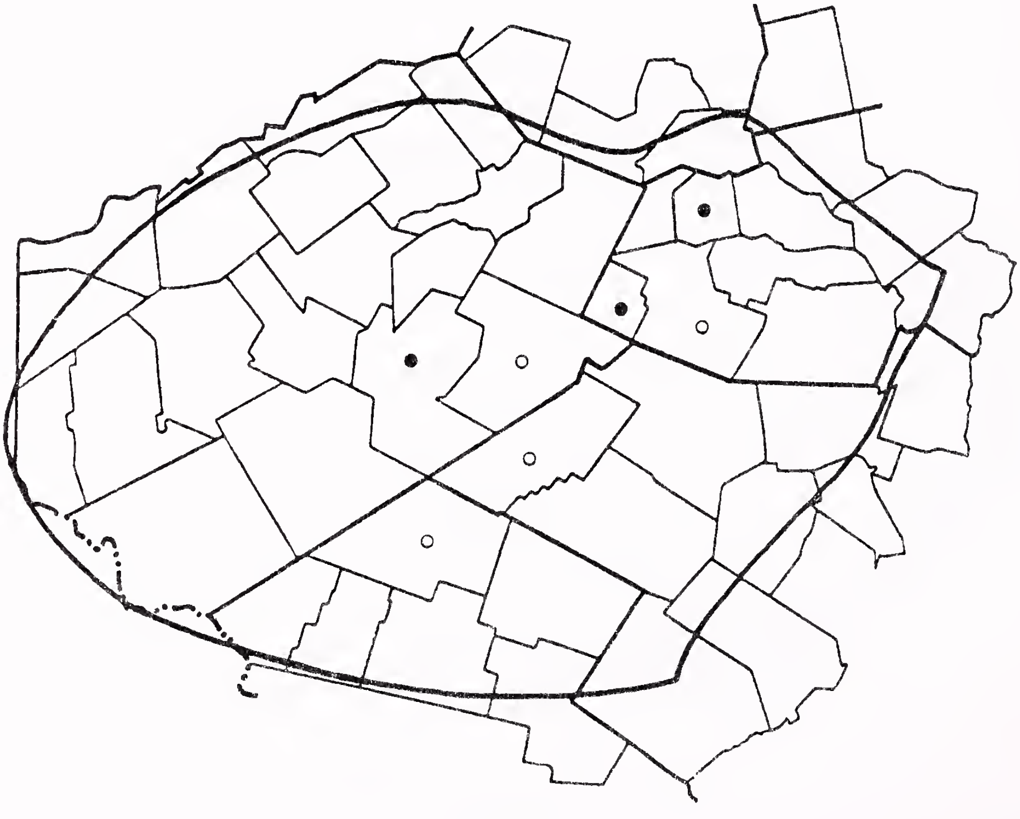
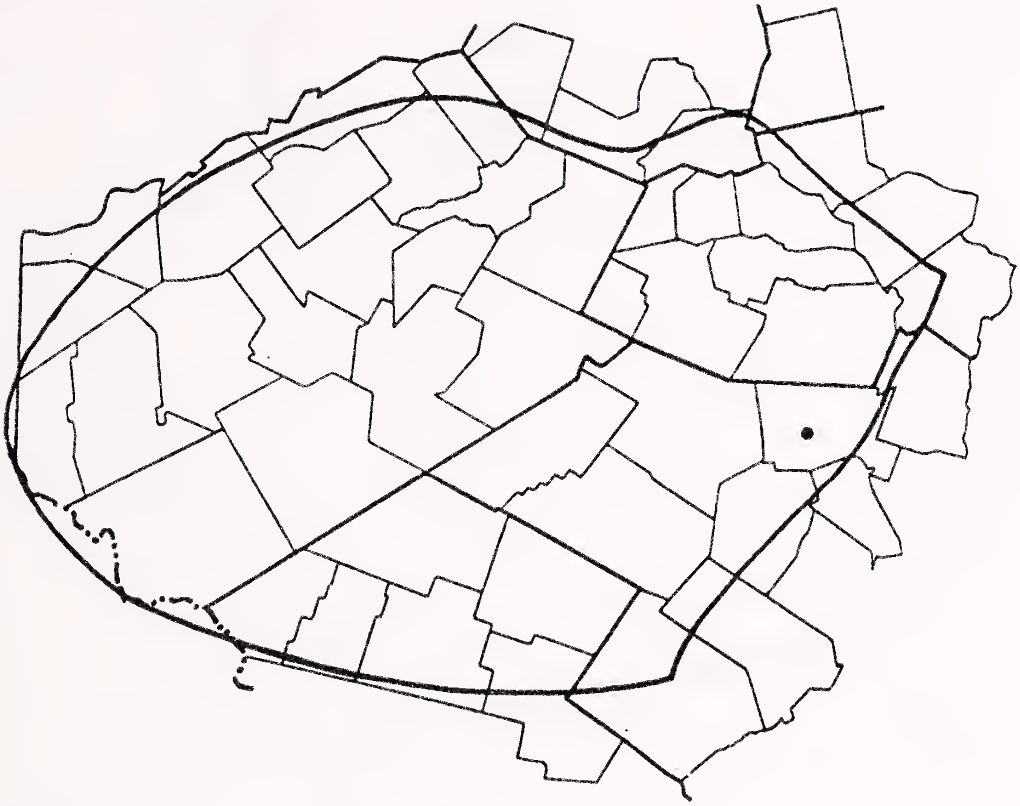
Maltese Cross



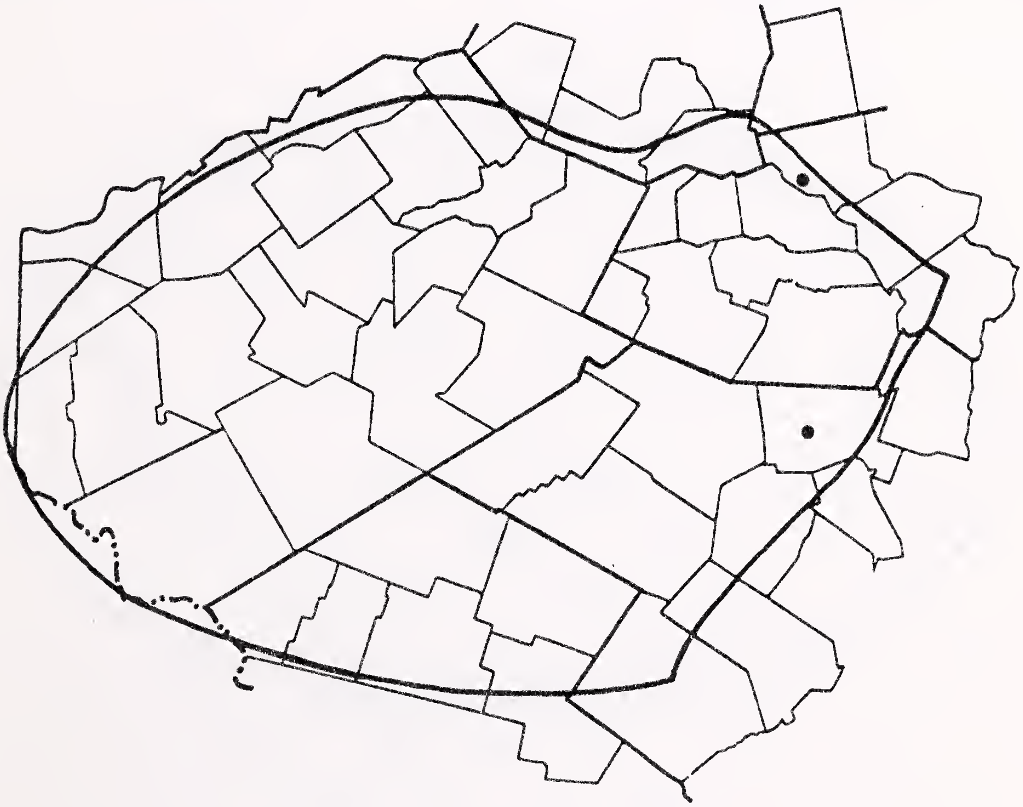
Lychnis flos-cuculi L.
Ragged Robin



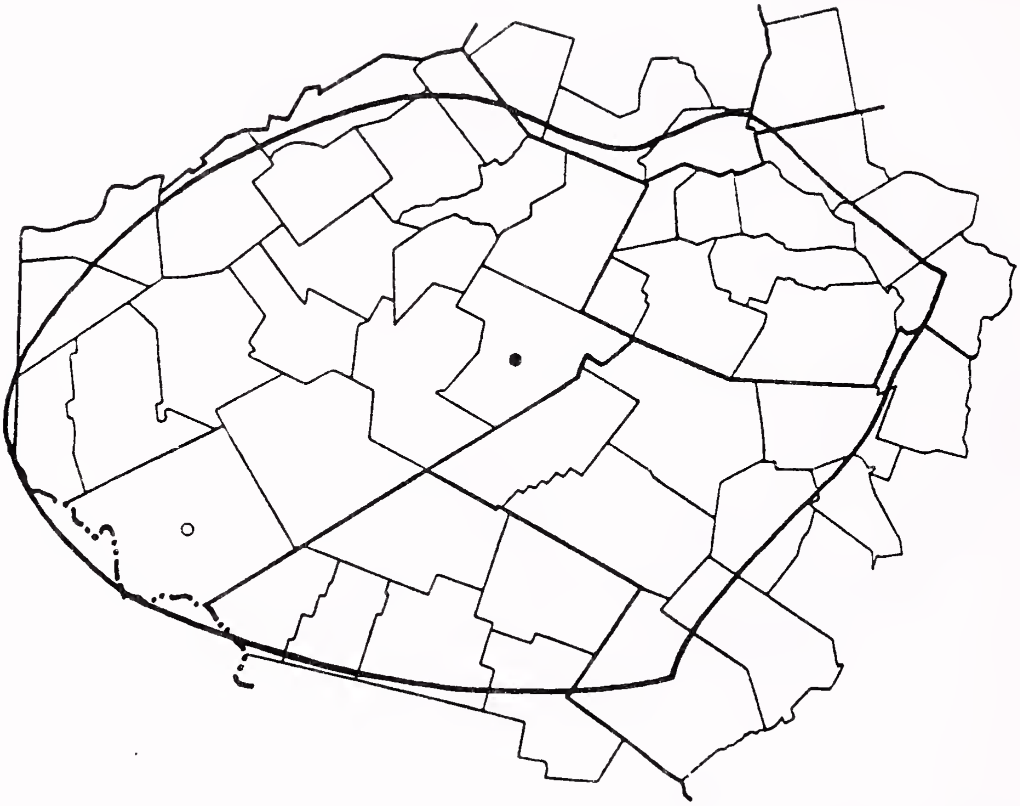
Paronychia canadensis (L.) Wood
Slender Forked Chickweed



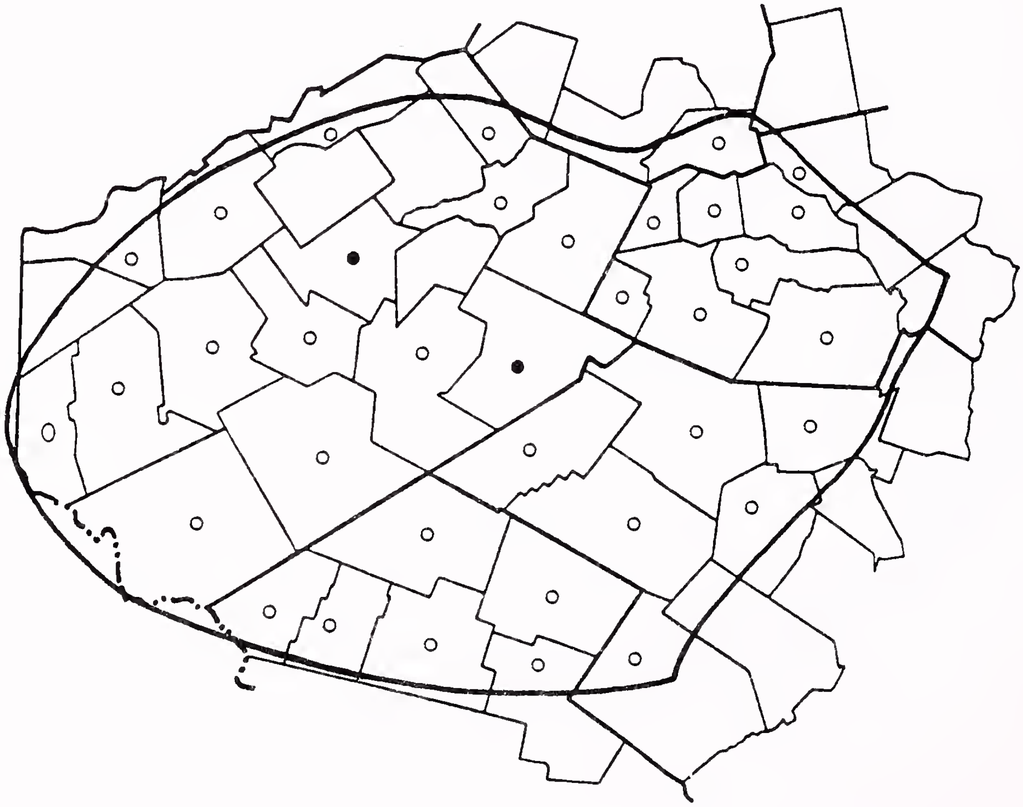
Paronychia fastigiata (Raf.) Fern.
Forked Chickweed



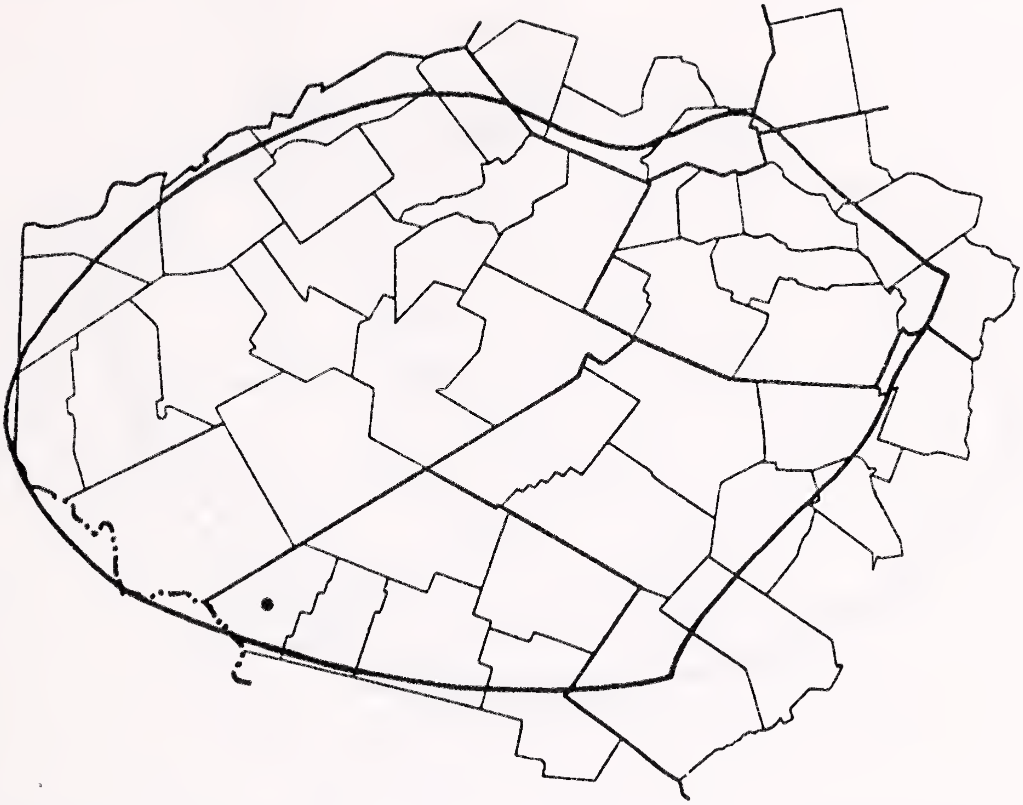
Sagina procumbens L.
Bird's-eye Pearlwort



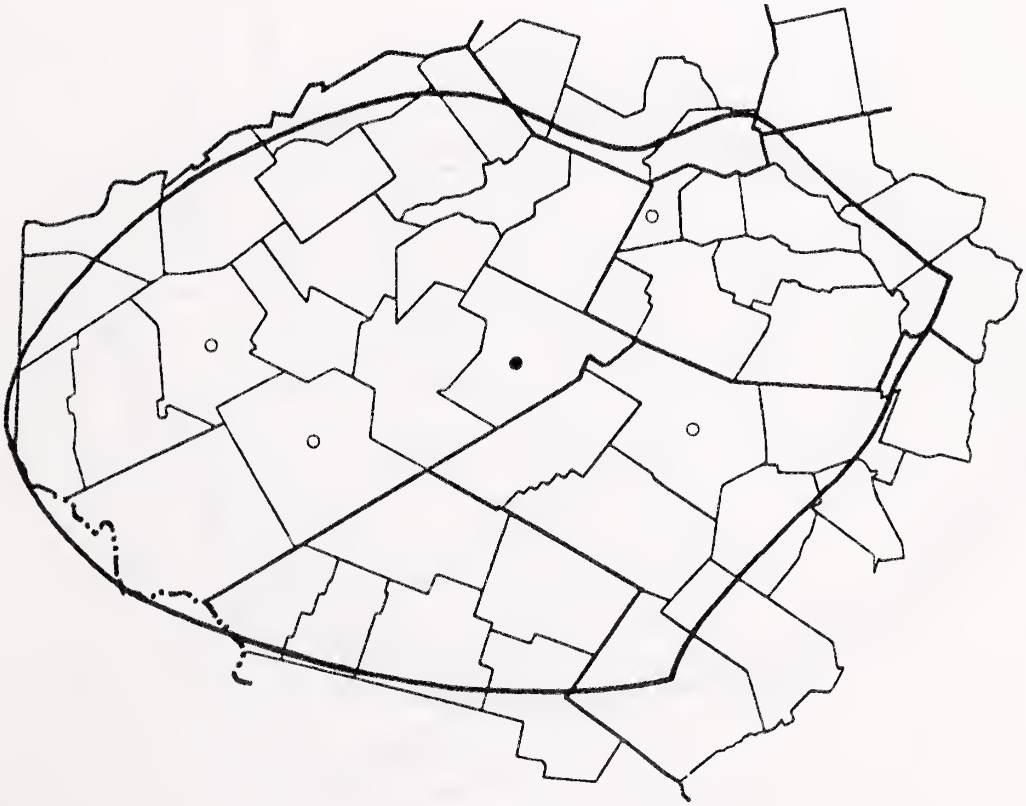
Saponaria officinalis L.
Soapwort, Bouncing Bet



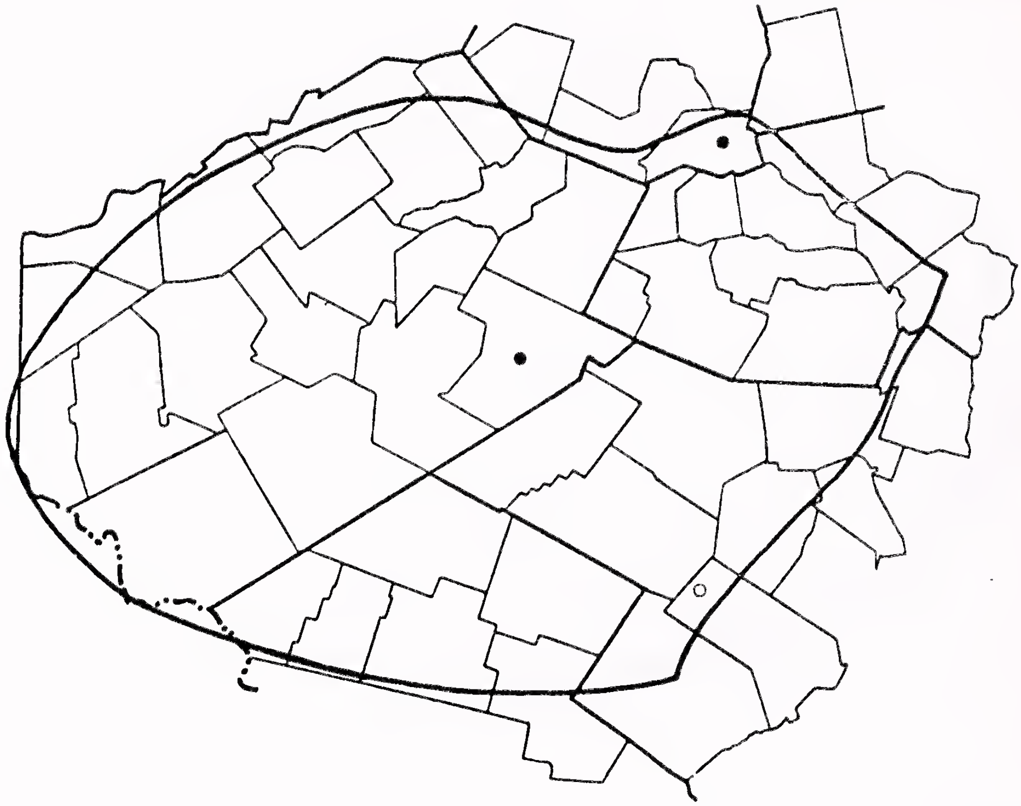
Saponaria vaccaria L.
Cowherb



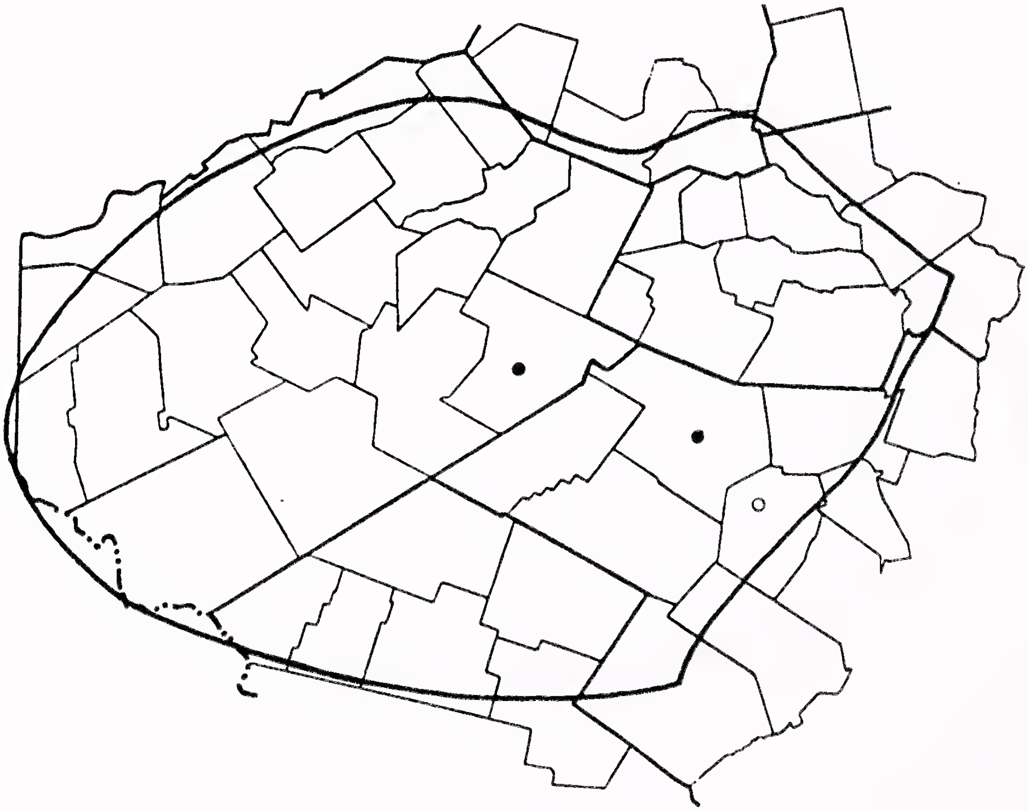
Scleranthus annuus L.
Knawel



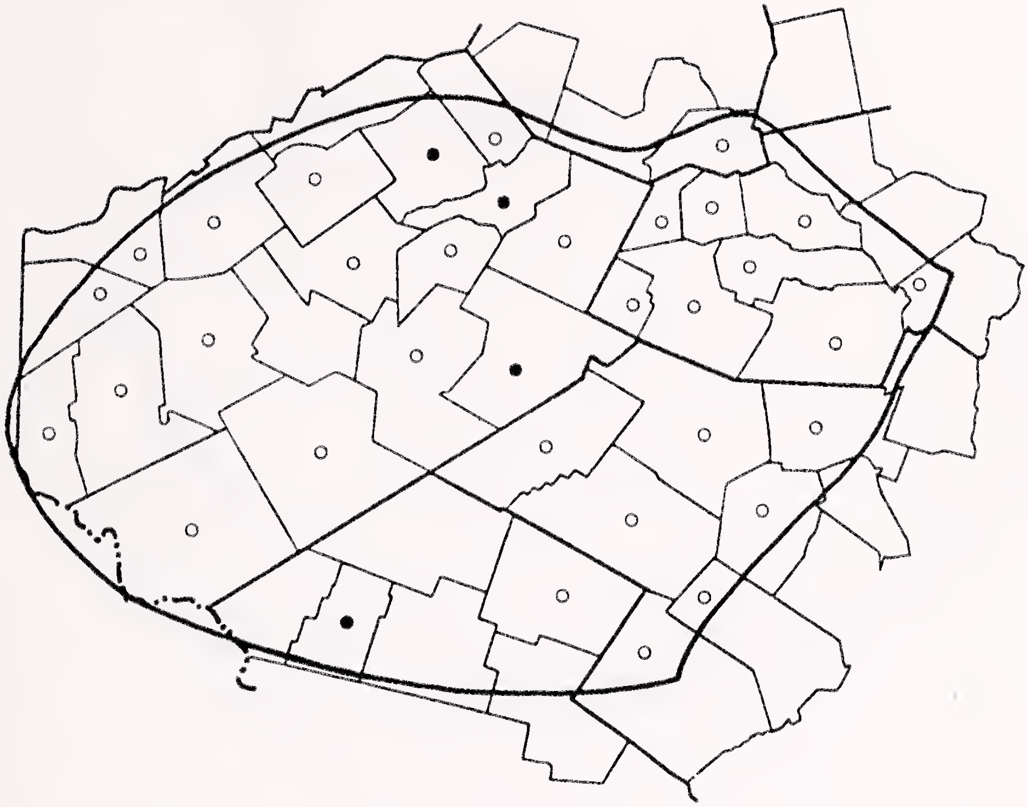
Silene antirrhina L.
Sleepy Catchfly



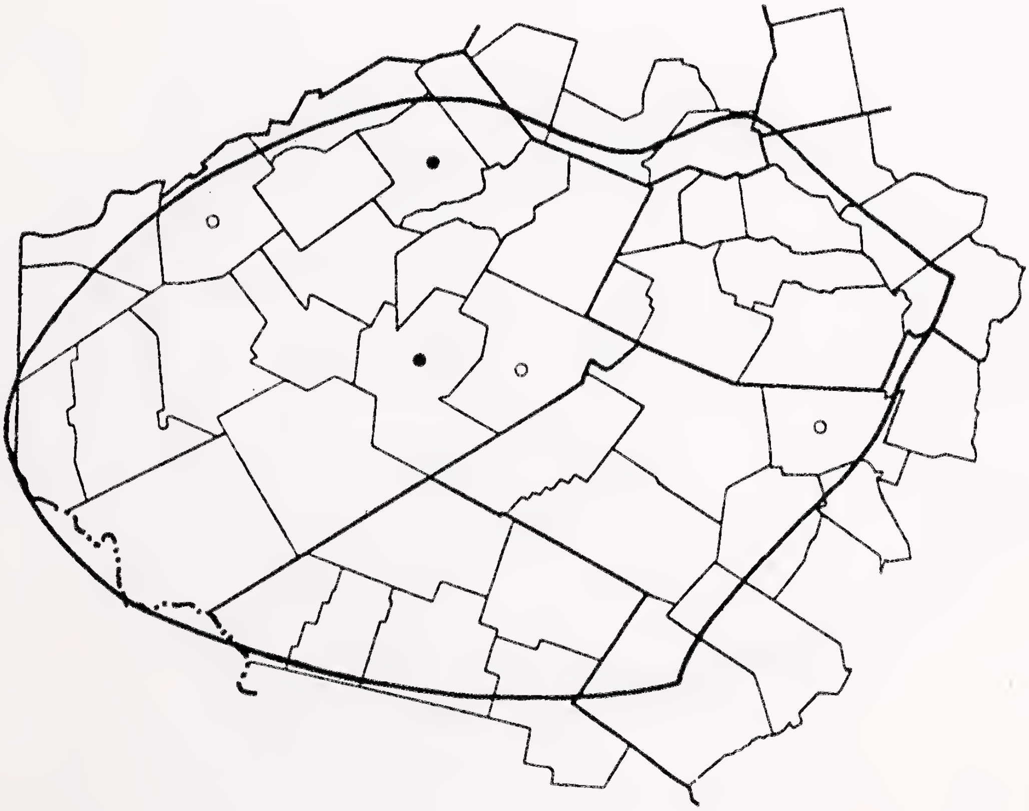
Silene armeria L.
Garden Catchfly



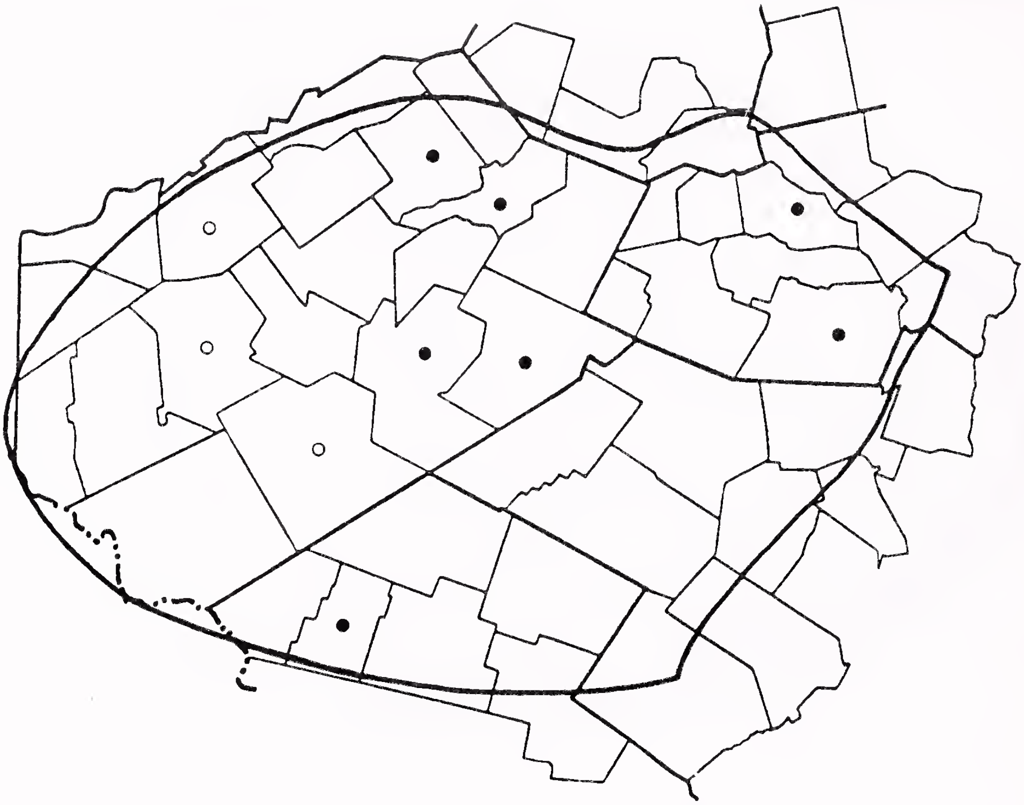
Silene cucubalus Wibel
Bladder-campion



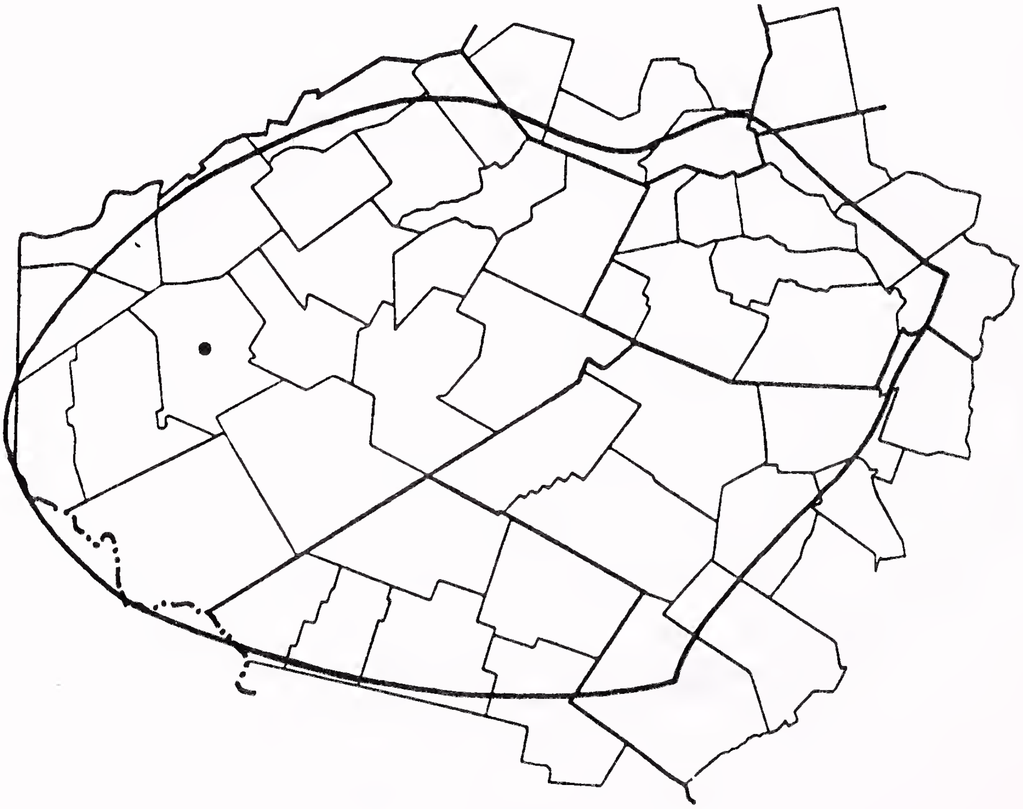
Silene noctiflora L.
Night-flowering Catchfly



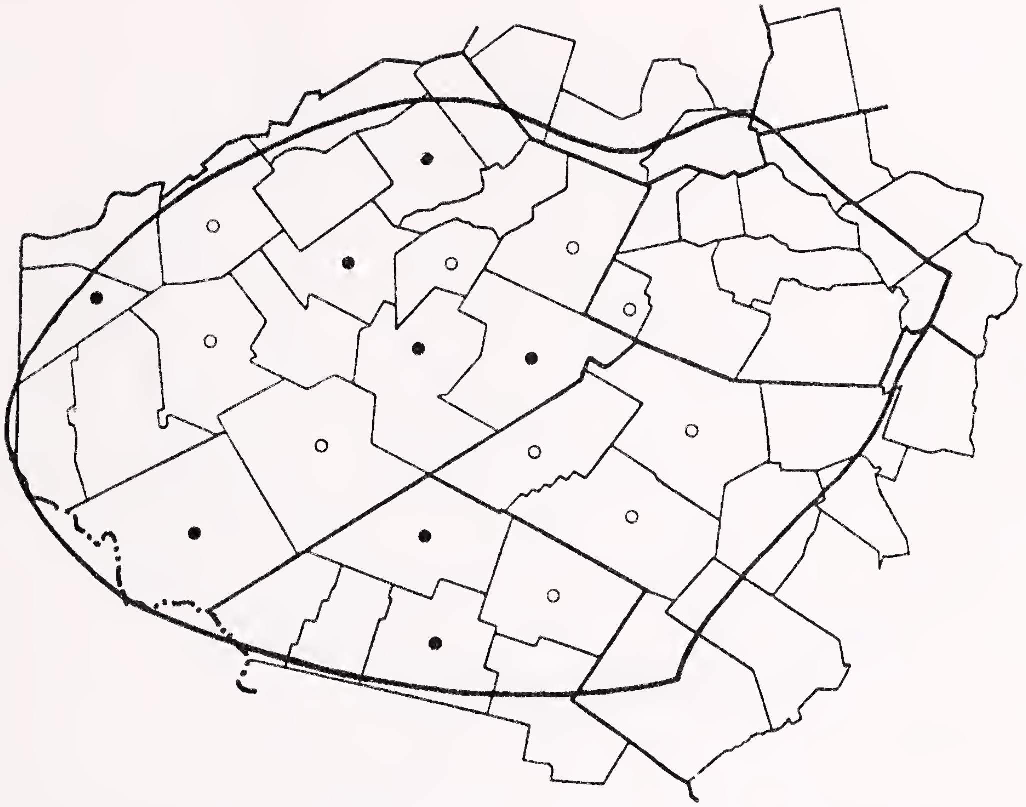
Spergula arvensis L.
Corn Spurry



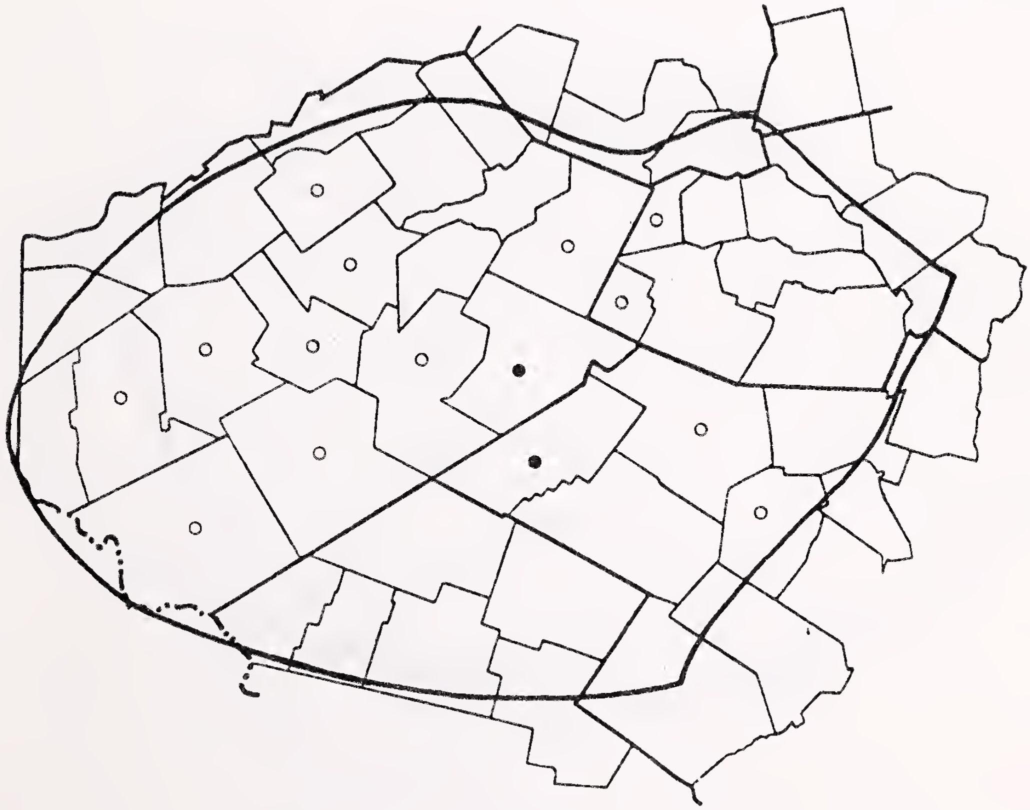
Spergularia rubra (L.) J. & C. Presl
Purple Sandwort



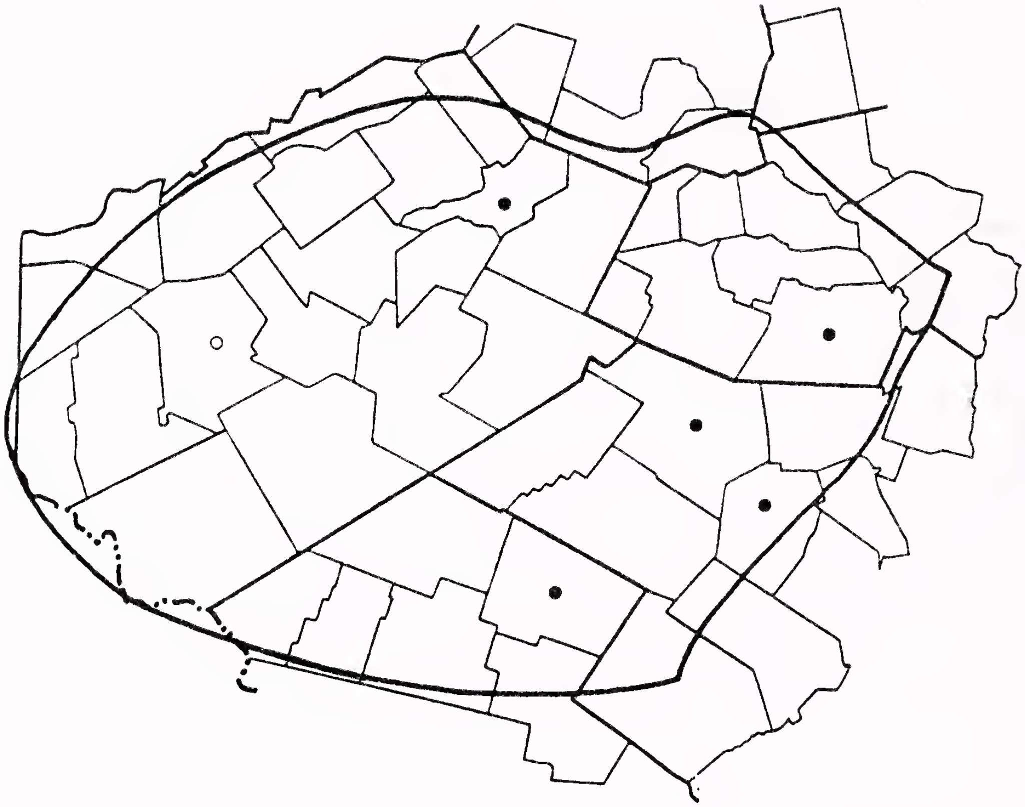
Stellaria alsine Grimm.
Bog Starwort



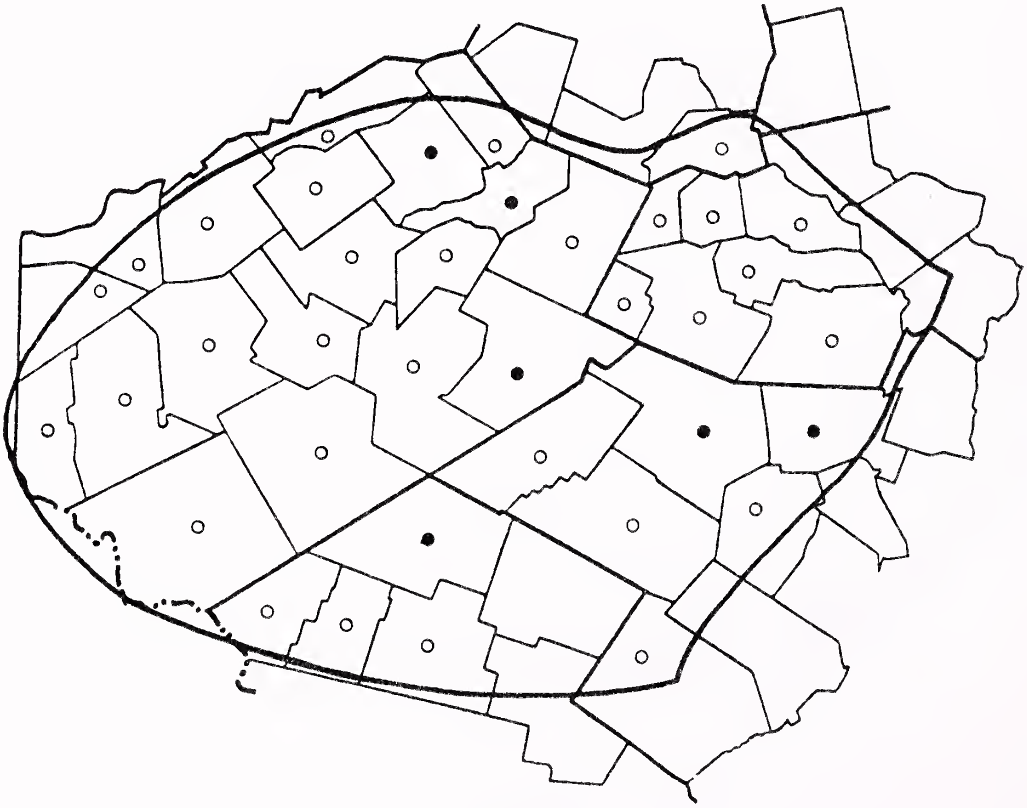
Stellaria aquatica (L.) Scop.
Giant Chickweed



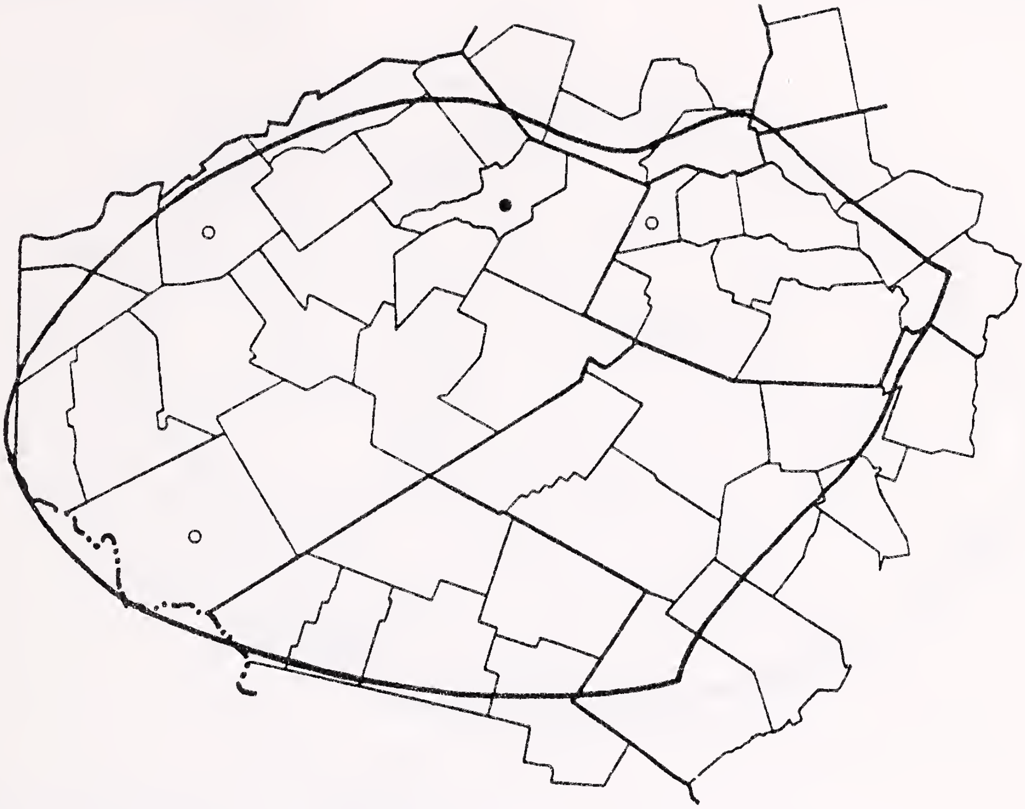
Stellaria calycantha (Ledeb.) Bong.
Northern Stitchwort



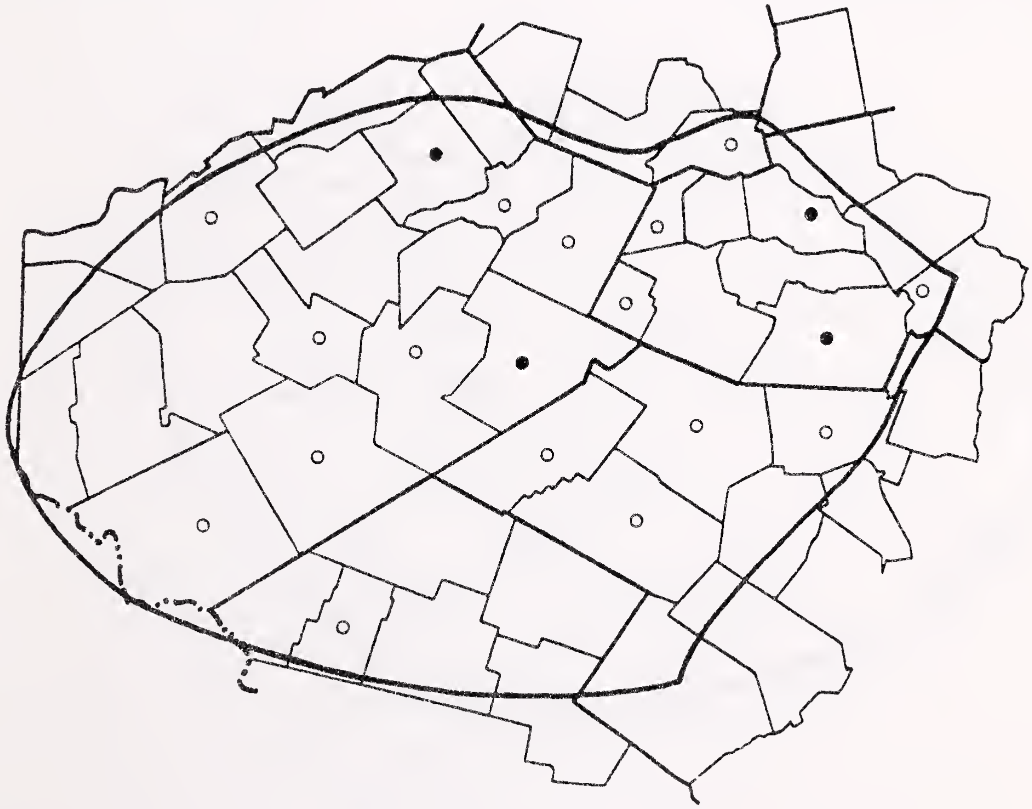
Stellaria graminea L.
Lesser Stitchwort



Stellaria longifolia Muhl.
Long-leaved Stitchwort

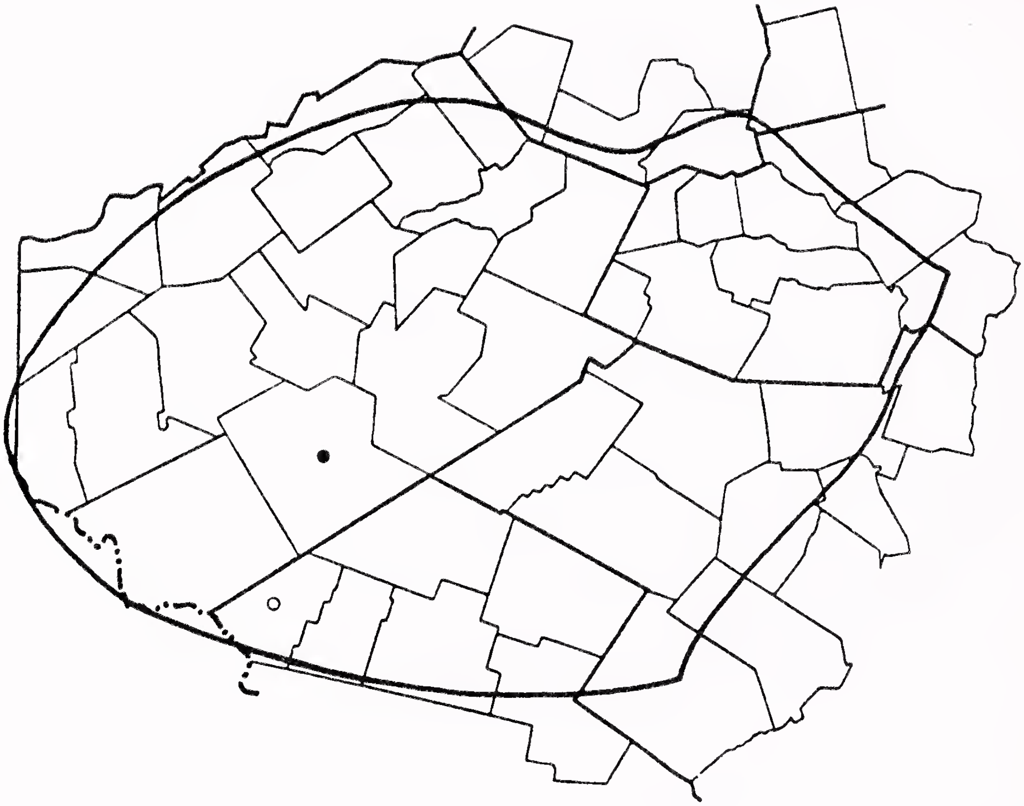


Stellaria media (L.) Cyrillo
Common Chickweed

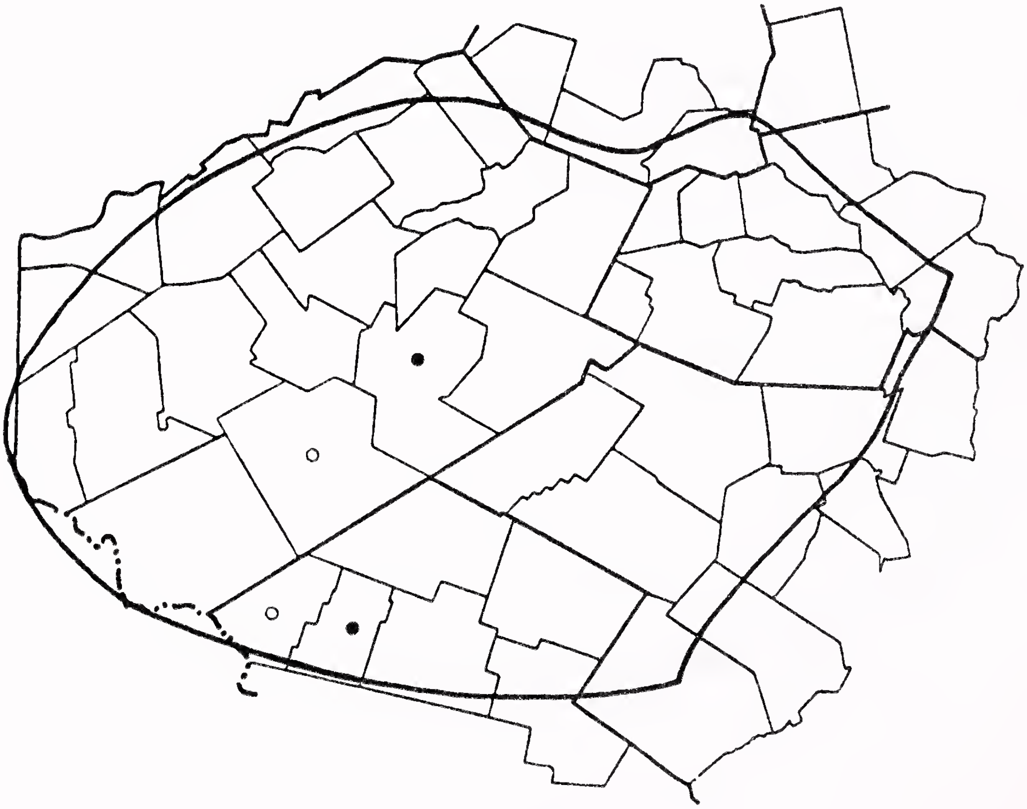


Ceratophyllum demersum L.

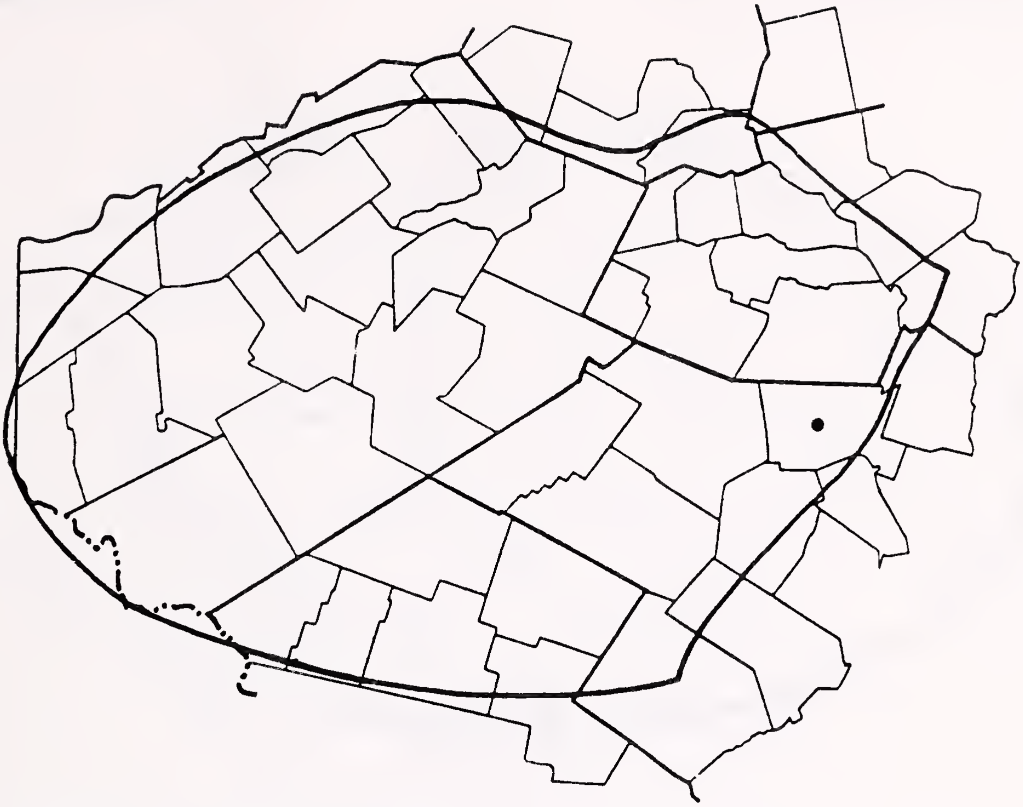
Coontail



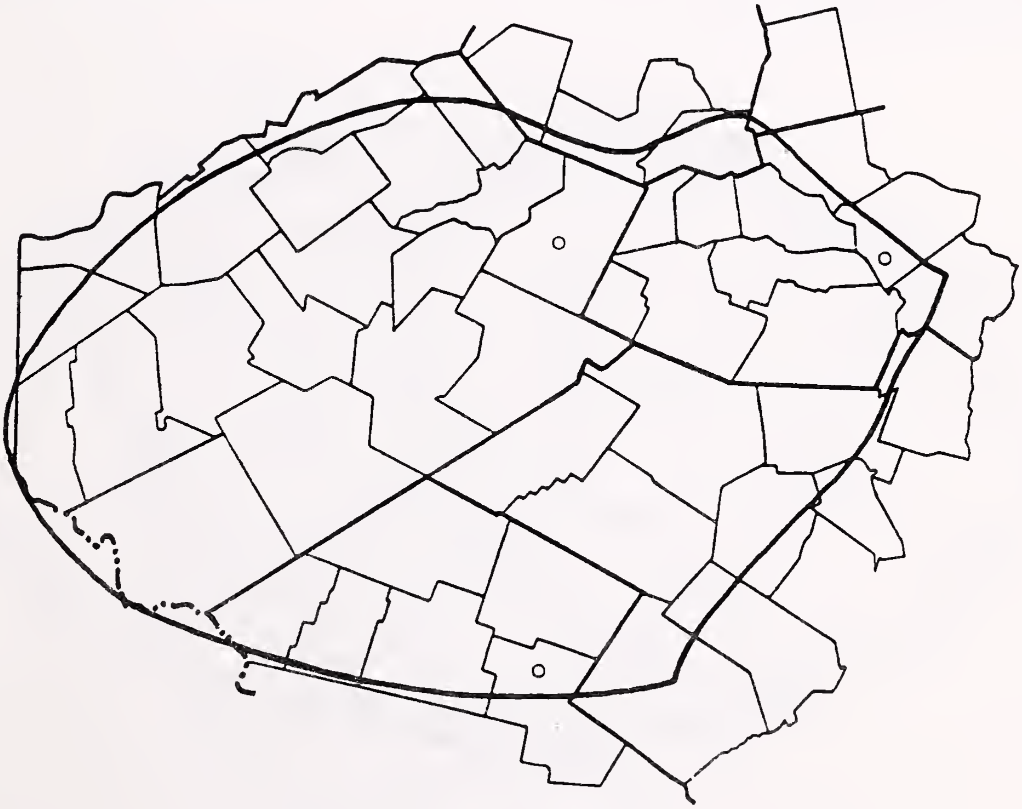
Brasenia schreberi Gmel.
Purple Wen-dock



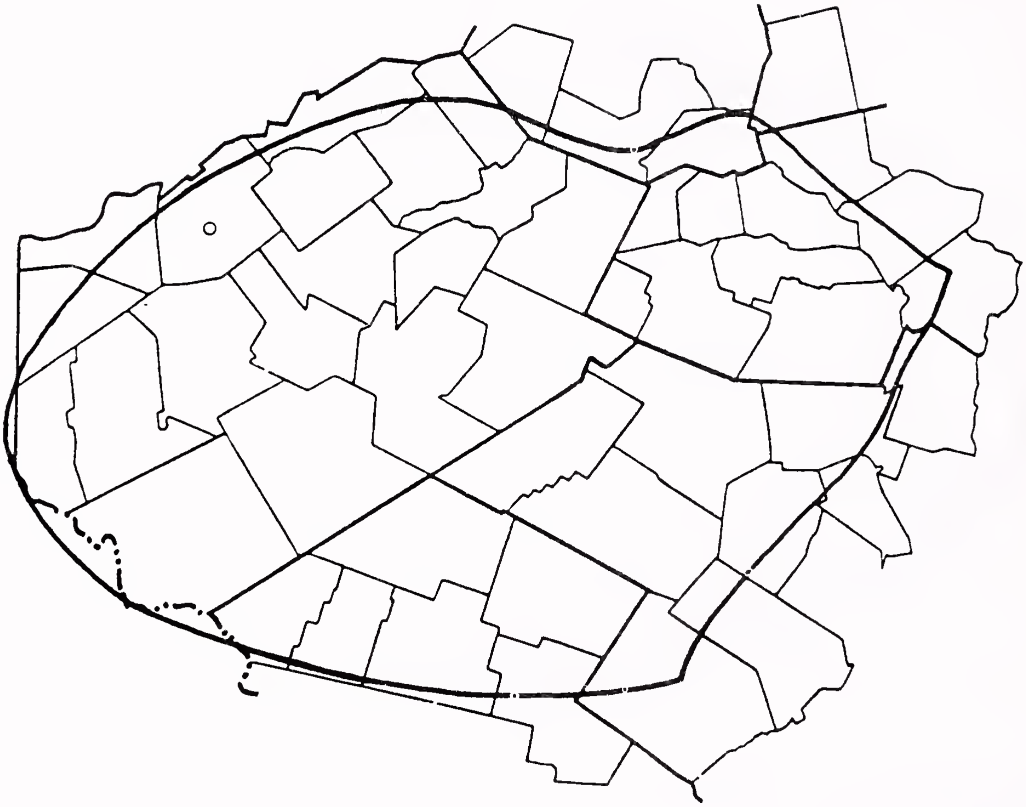
Cabomba caroliniana Gray
Carolina Fanwort



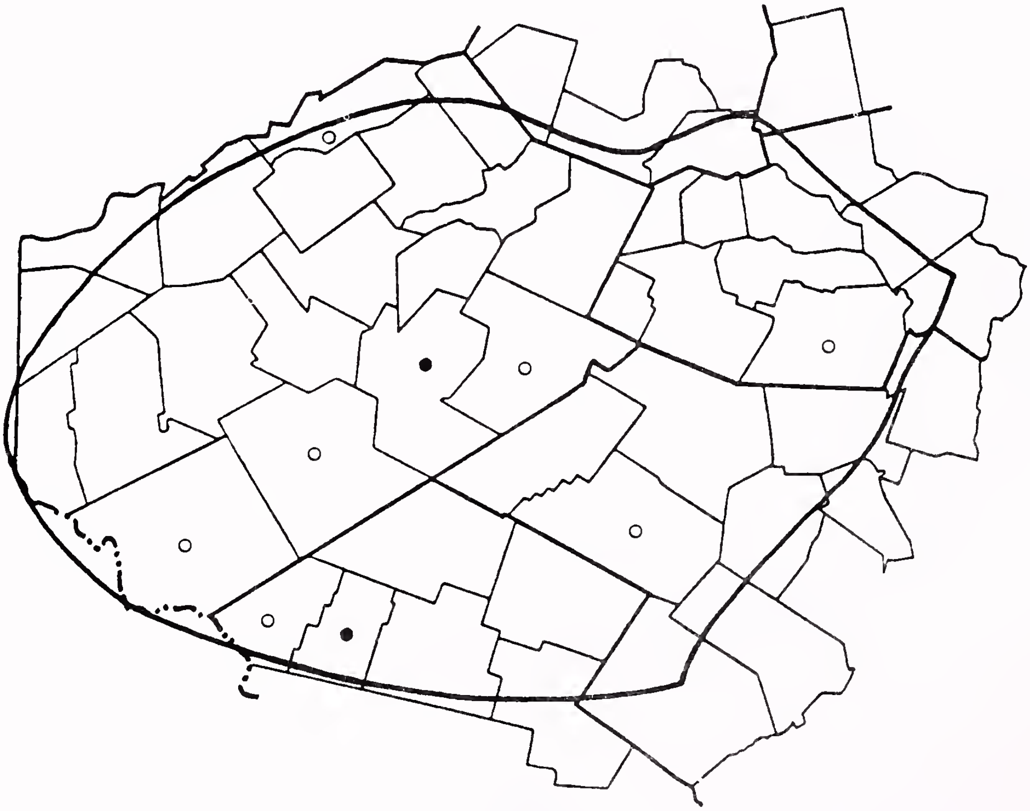
Nuphar luteum (L.) Sibth. & Smith
ssp. macrophyllum (Small) Beal
Large-leaved Spatterdock



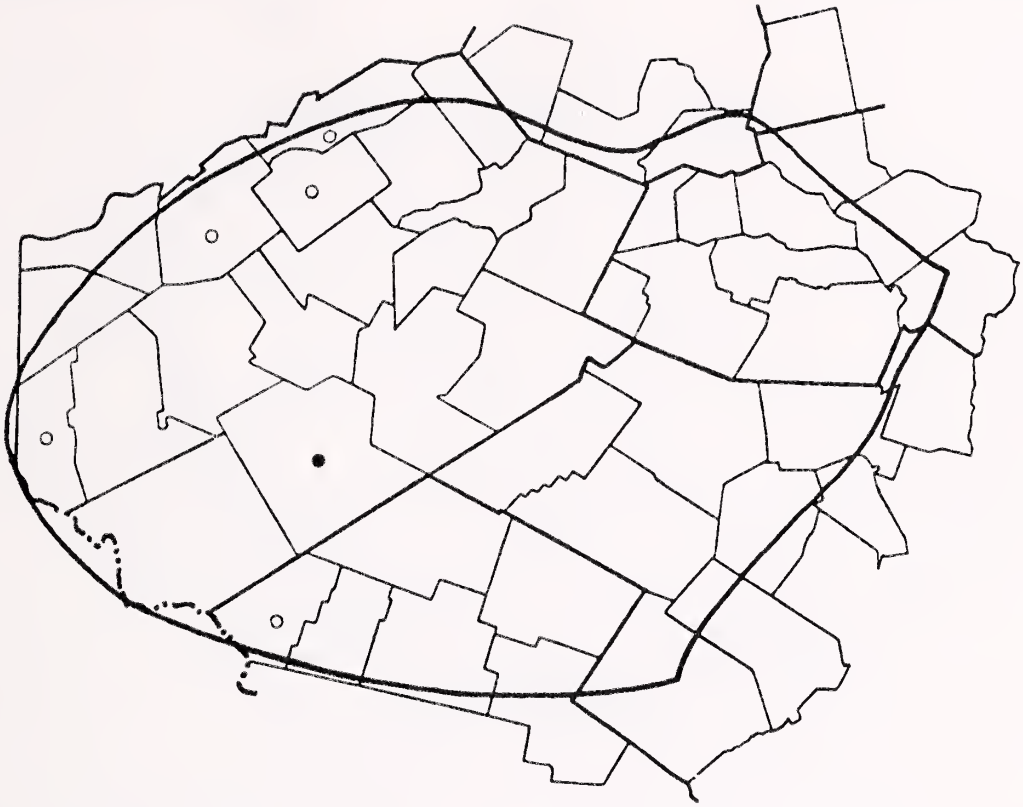
Nuphar luteum (L.) Sibth. & Smith
ssp. pumilum (Timm.) Beal
Small-leaved Spatterdock



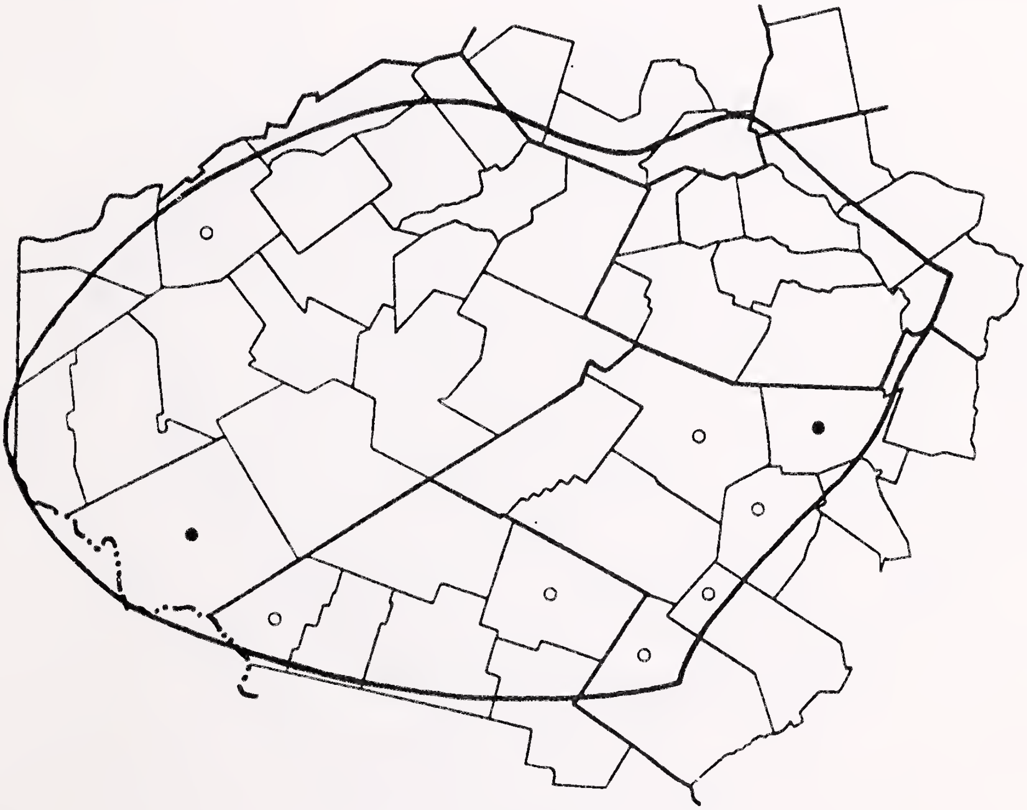
Nuphar luteum (L.) Sibth. & Smith
ssp. variegatum (Durand) Beal
Bull-head Pond-lily



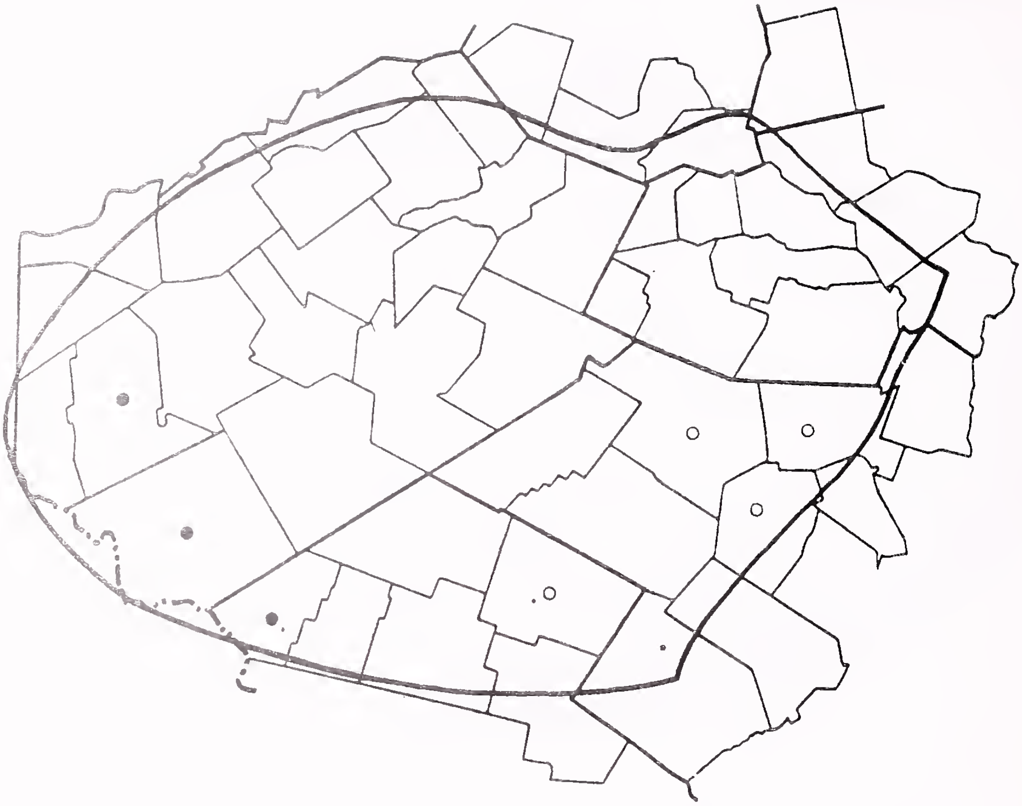
Nymphaea odorata Ait.
Fragrant Water-lily



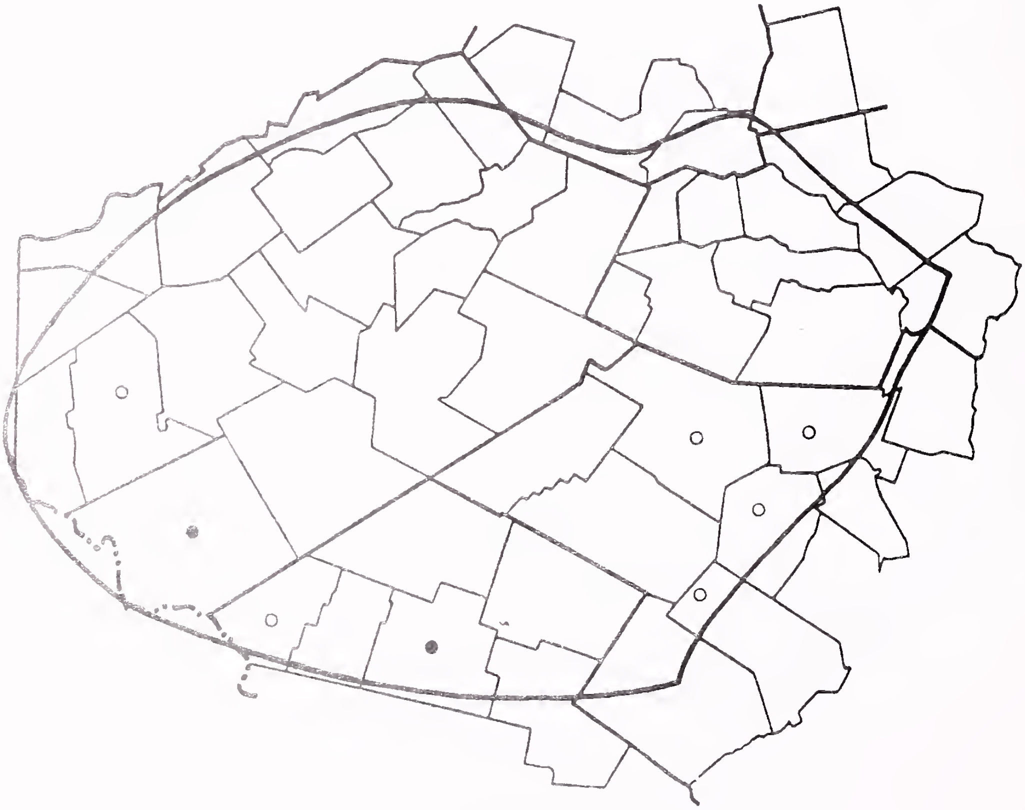
Liriodendron tulipifera L.
Tulip-tree



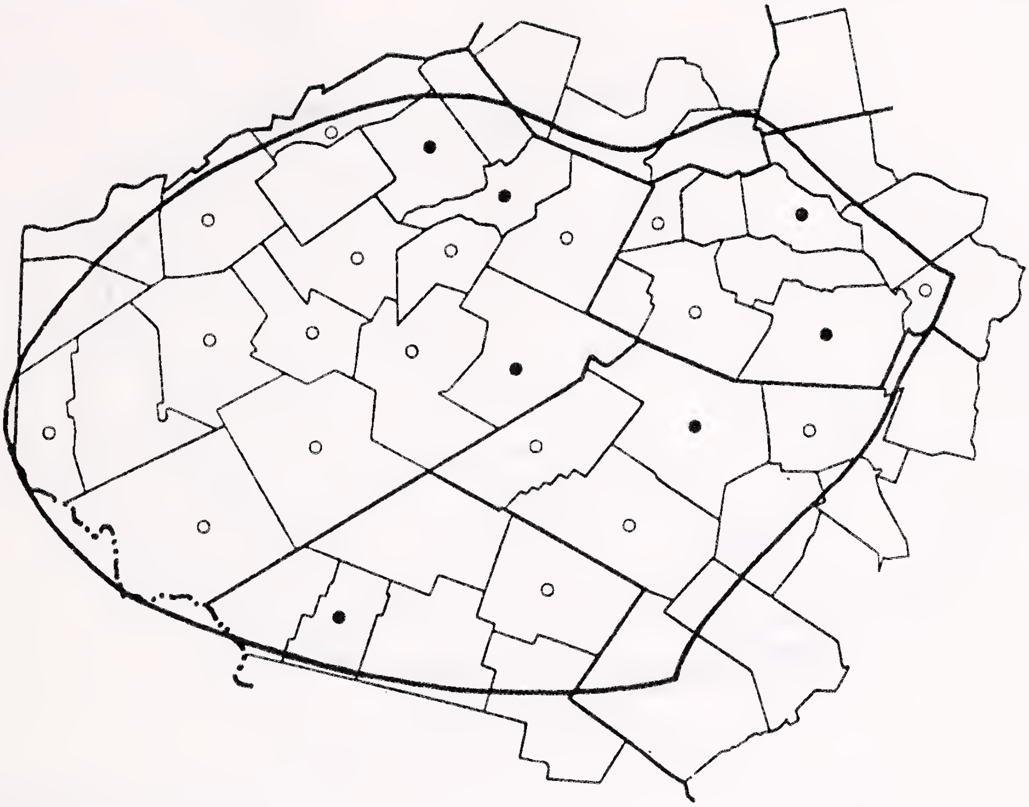
Lindera benzoin (L.) Blume
Spicebush



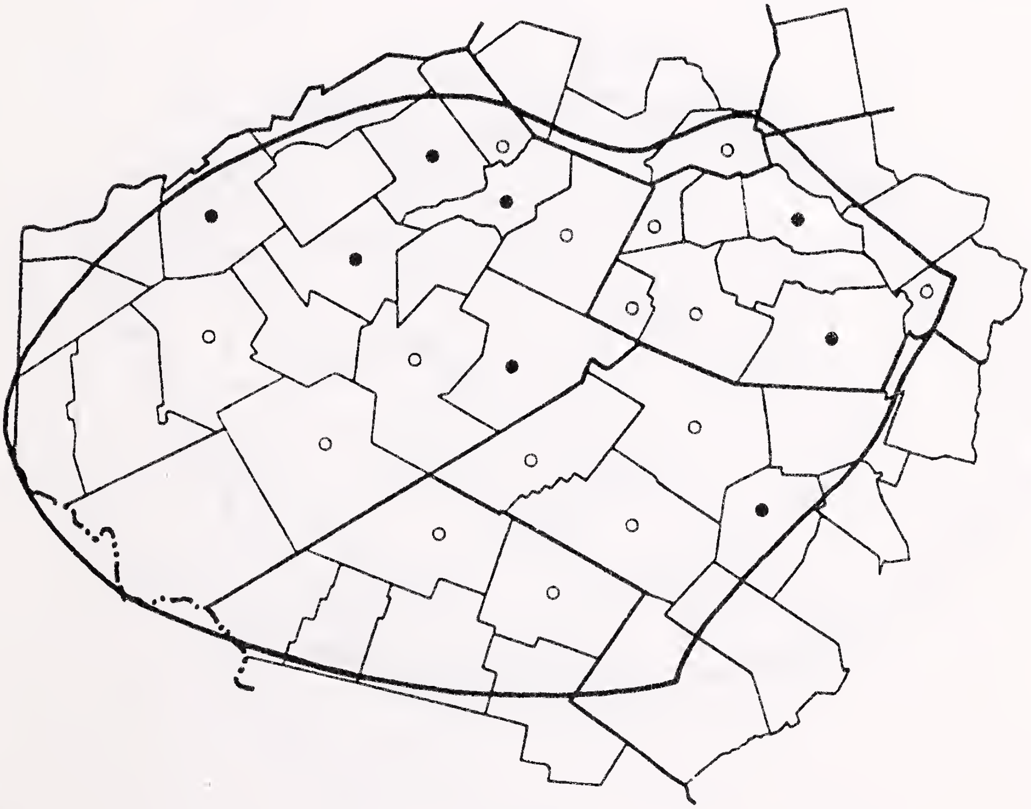
Sassafras albidum (Nutt.) Nees.
Sassafras



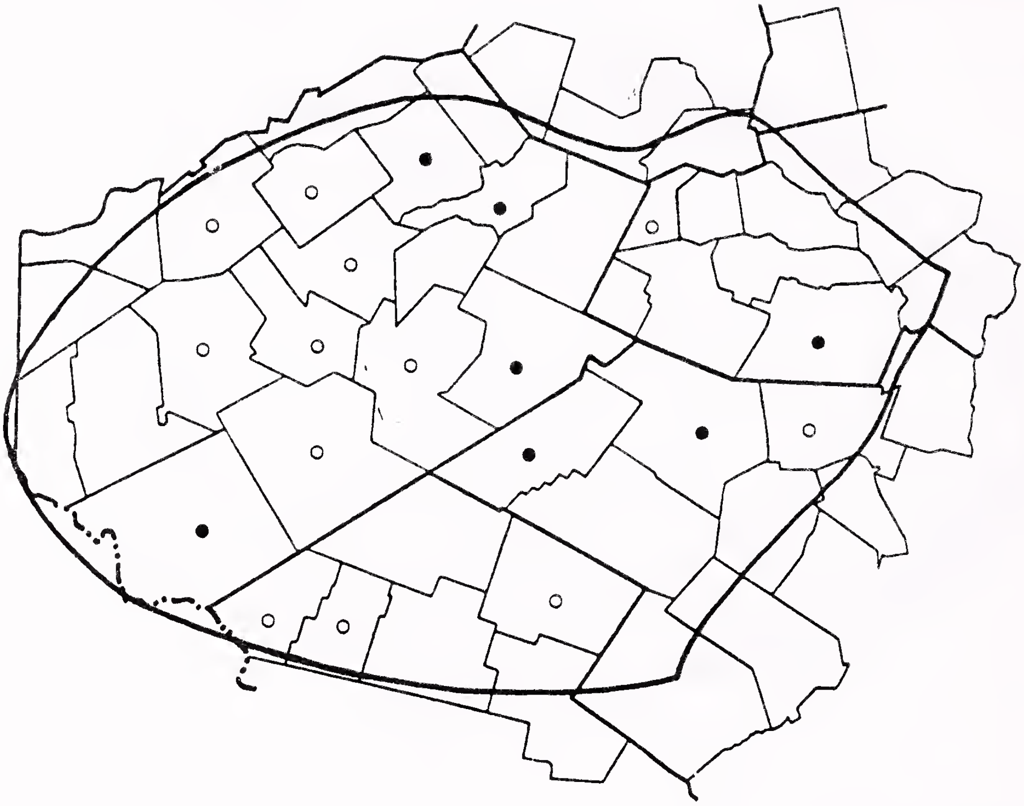
Actaea alba (L.) Mill.
White Baneberry



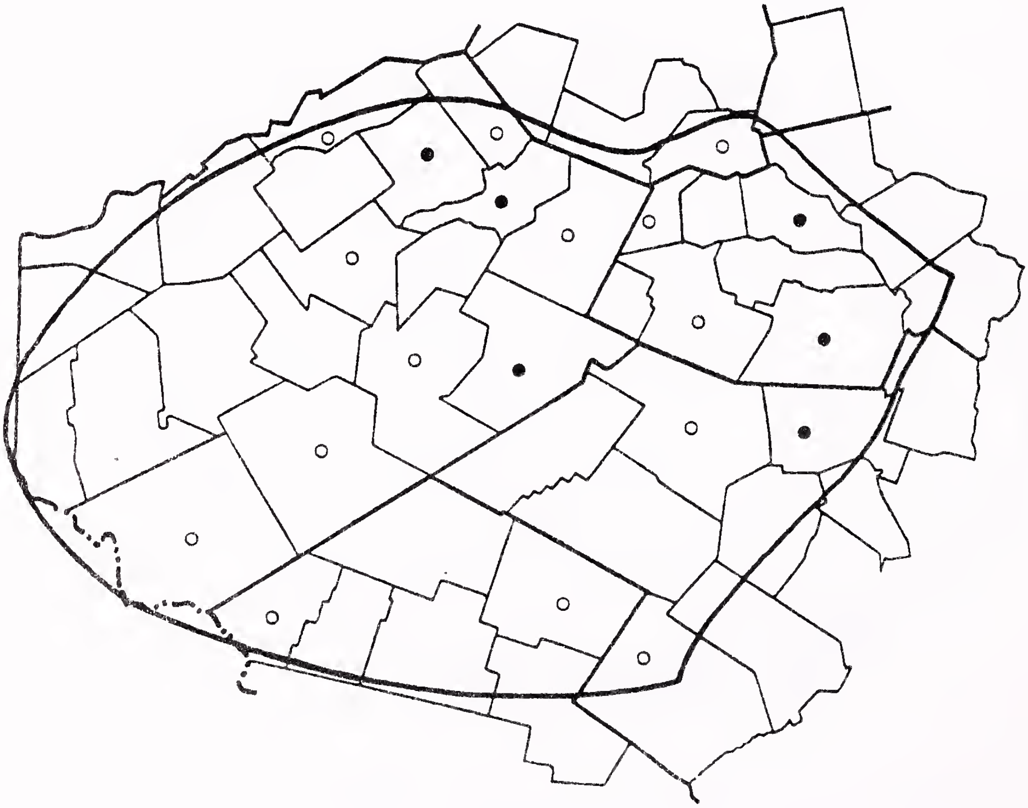
Actaea rubra (Ait.) Willd.
Red Baneberry



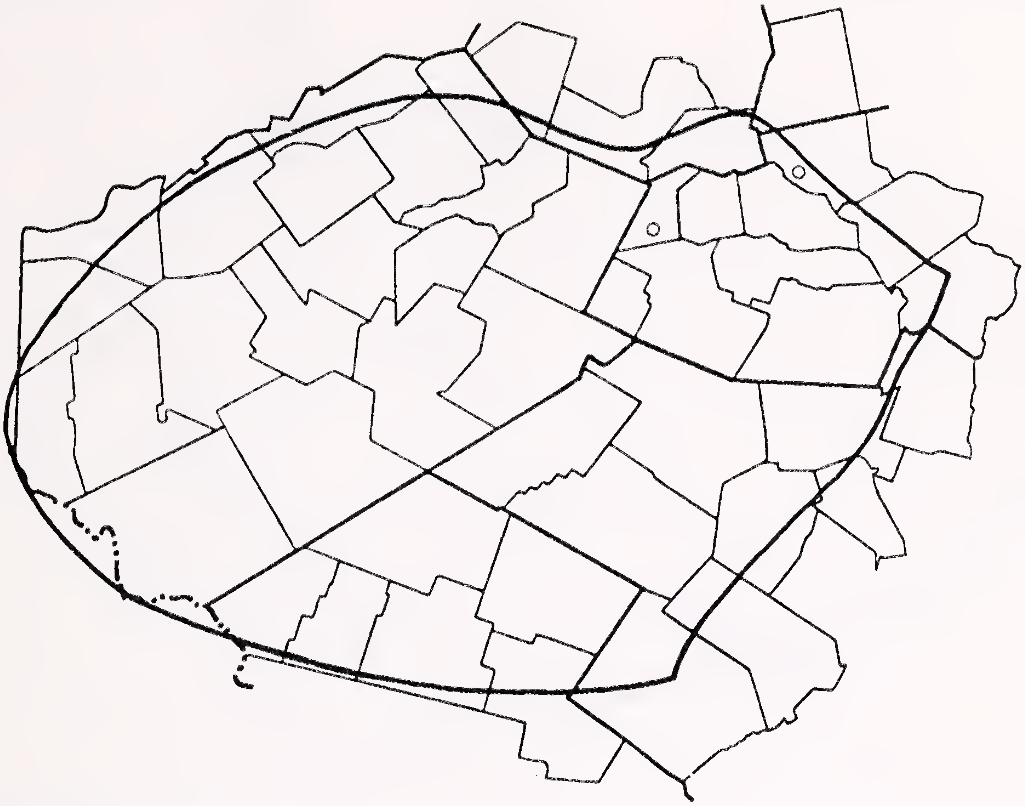
Anemone quinquefolia L.
Wood Anemone, Windflower



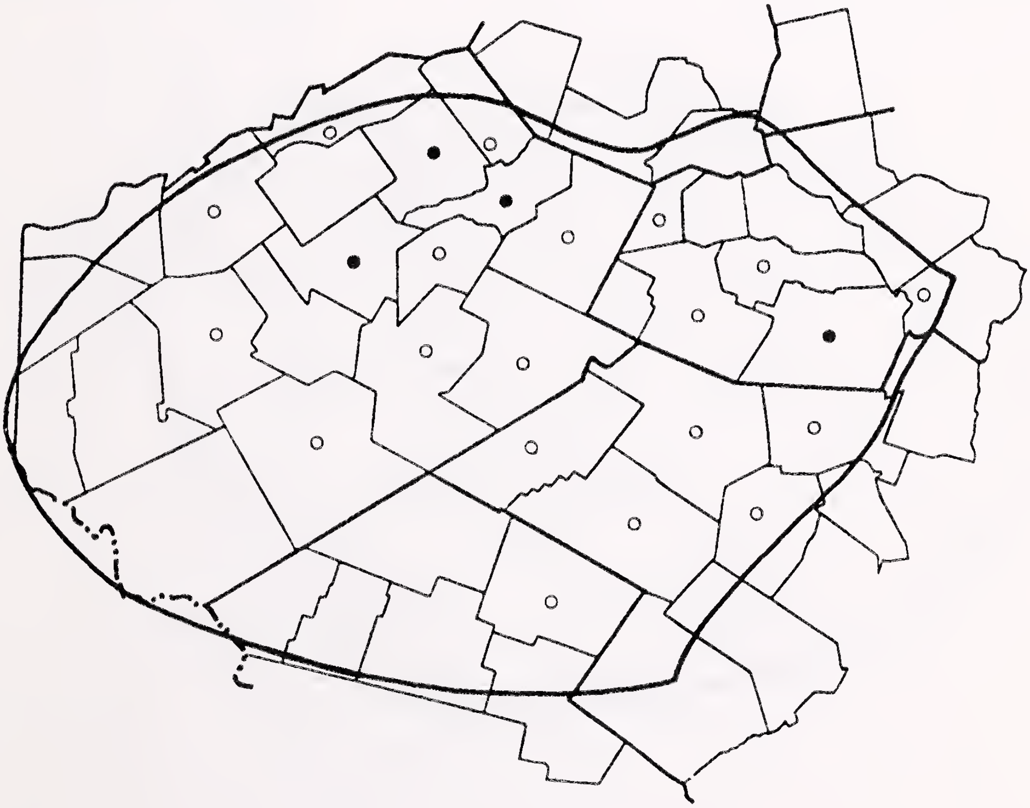
Anemone virginiana L.
Thimbleweed



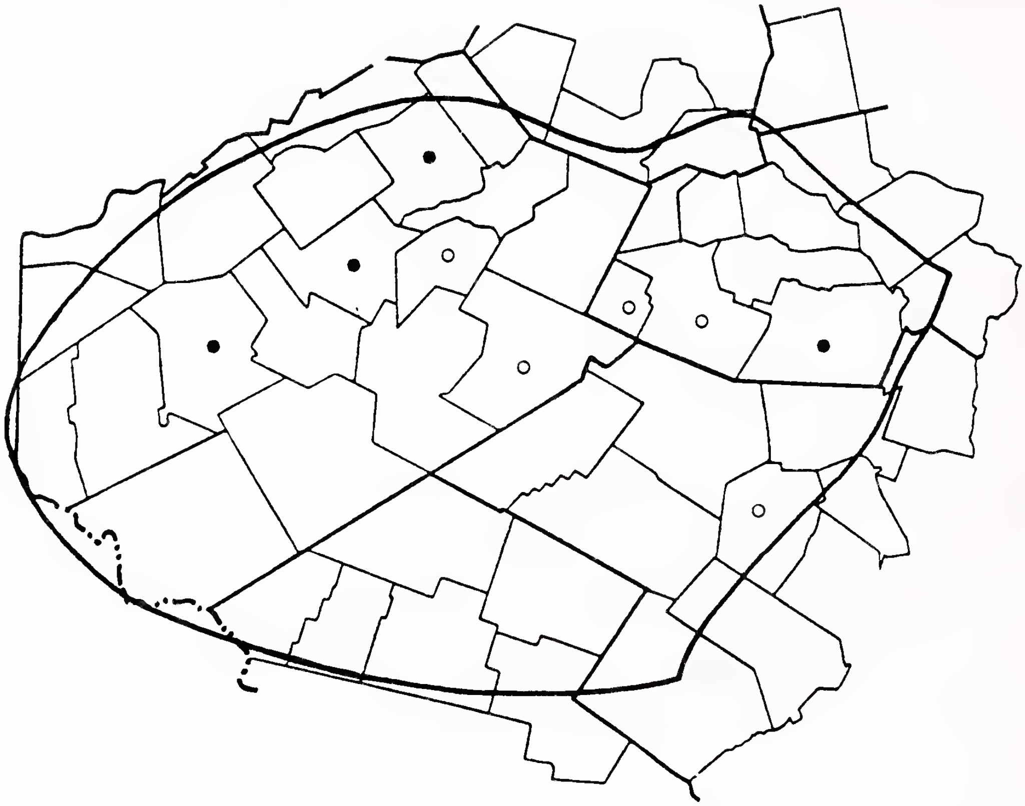
Anemonella thalictroides (L.) Spach
Rue-anemone



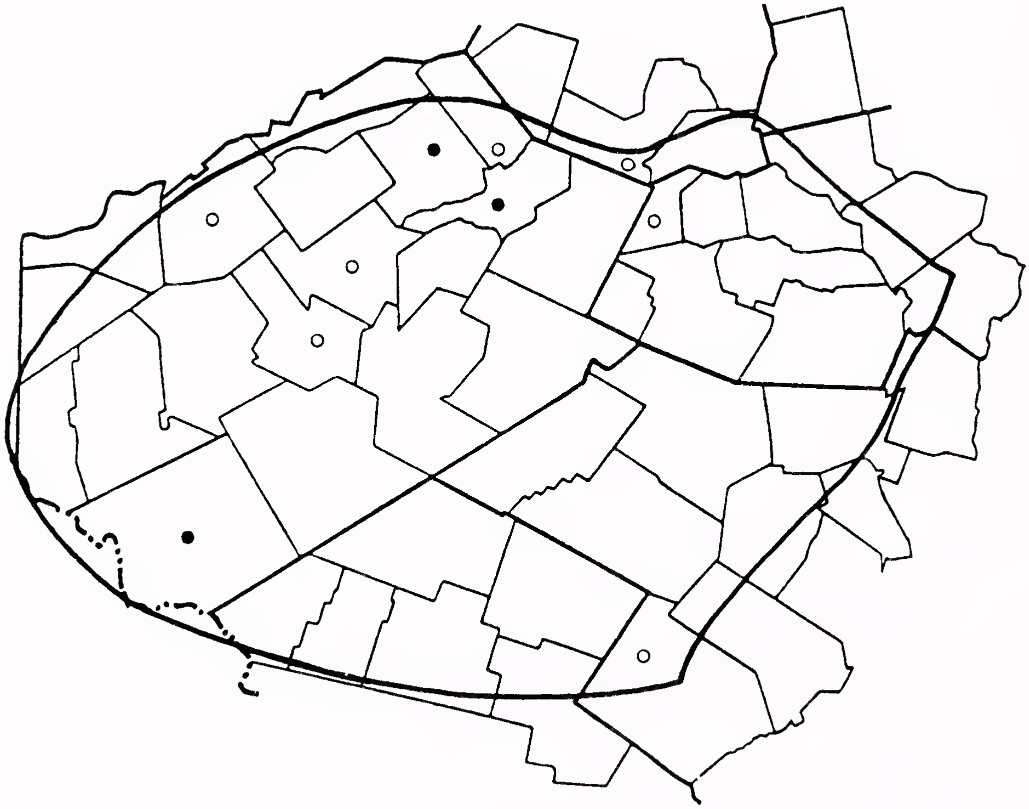
Aquilegia canadensis L.
Wild Columbine



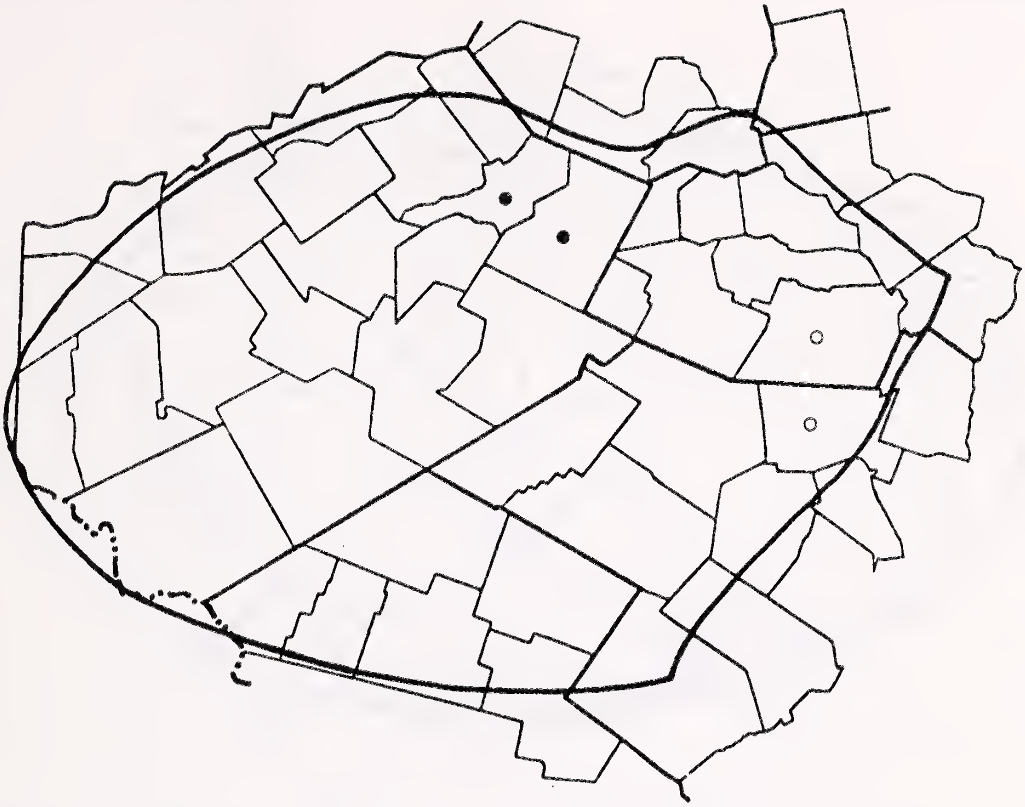
Aquilegia vulgaris L.
Garden Columbine



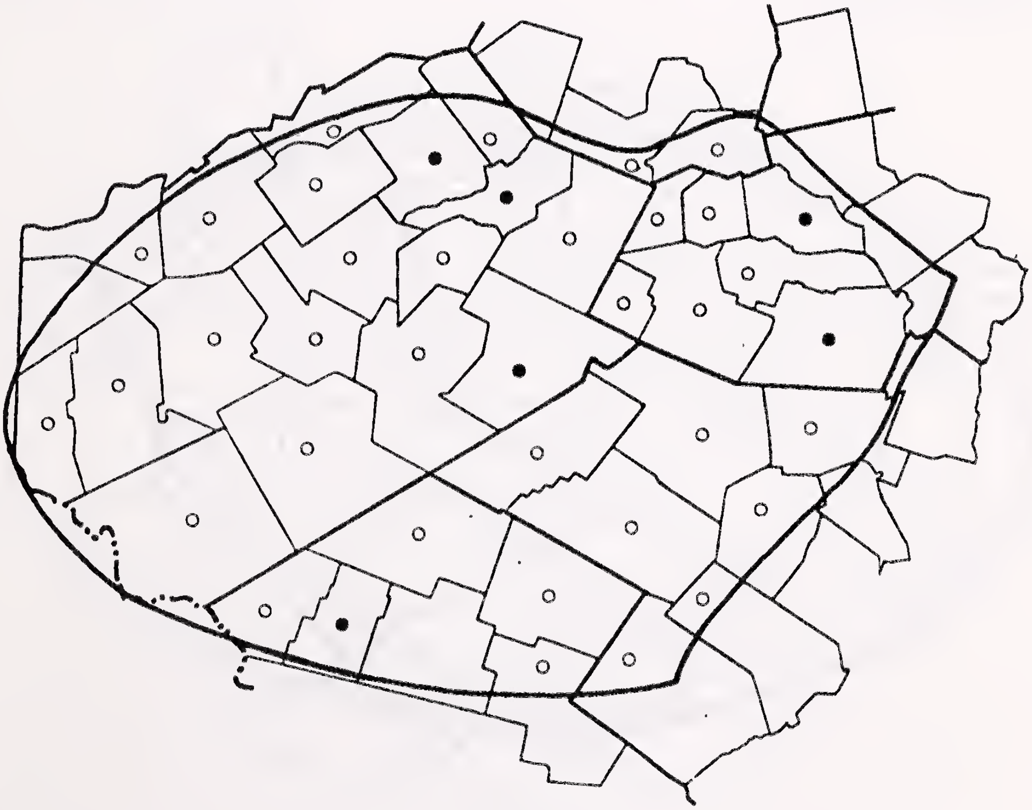
Caltha palustris L.
Marsh Marigold



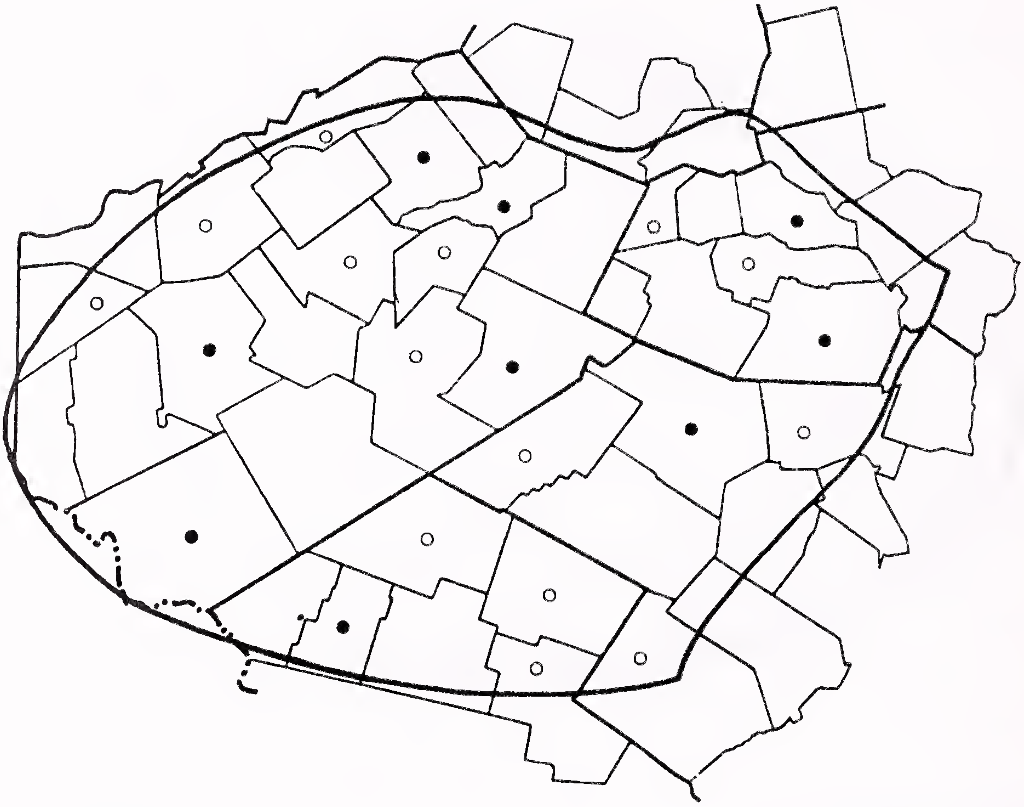
Clematis occidentalis (Hornem.) DC.
Purple Clematis



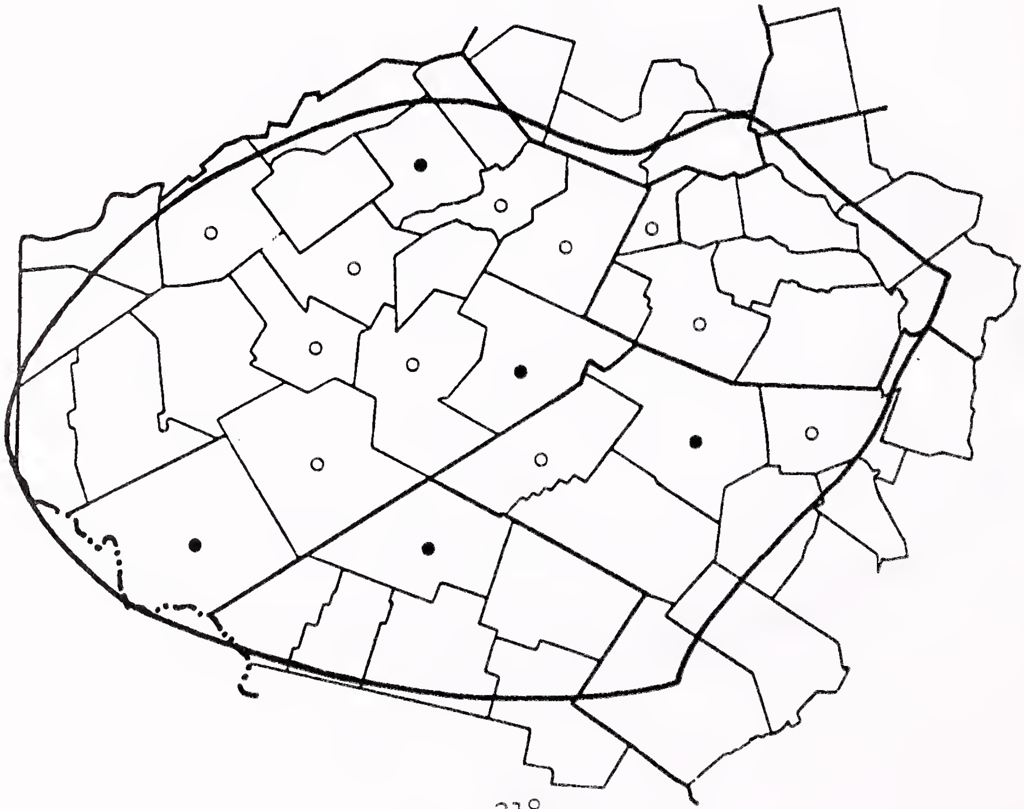
Clematis virginiana L.
Virgin's Bower



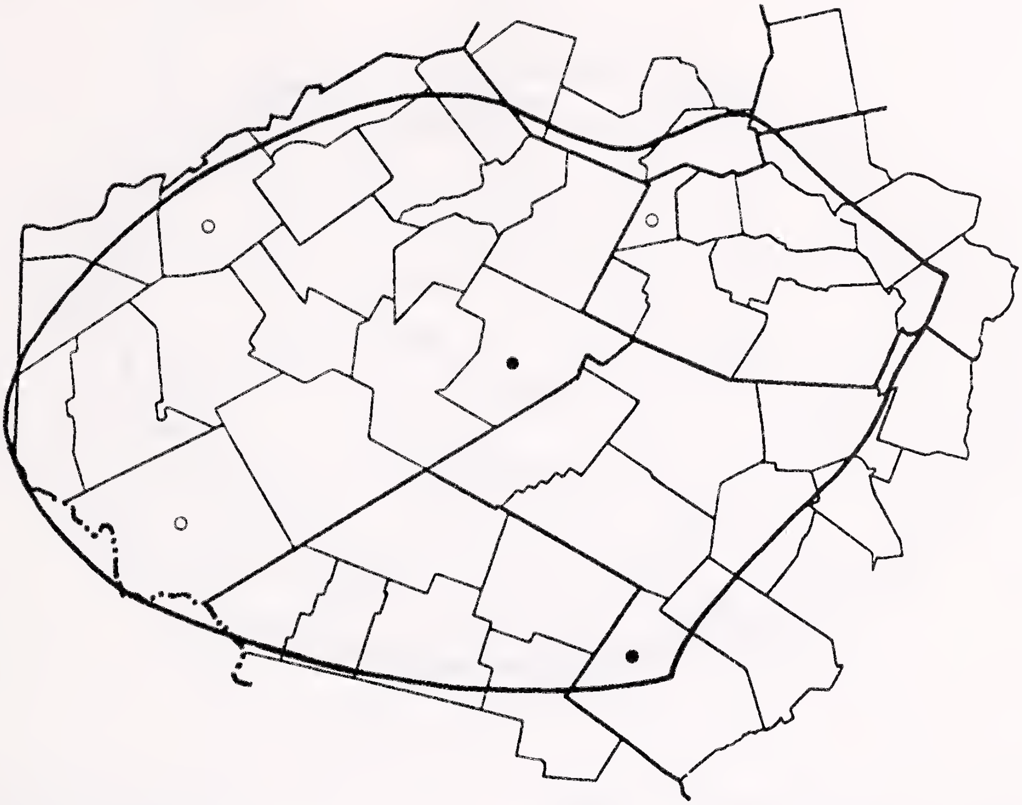
Coptis trifolia (L.) Salisb.
ssp. groenlandica (Oeder) Hult.
Goldthread



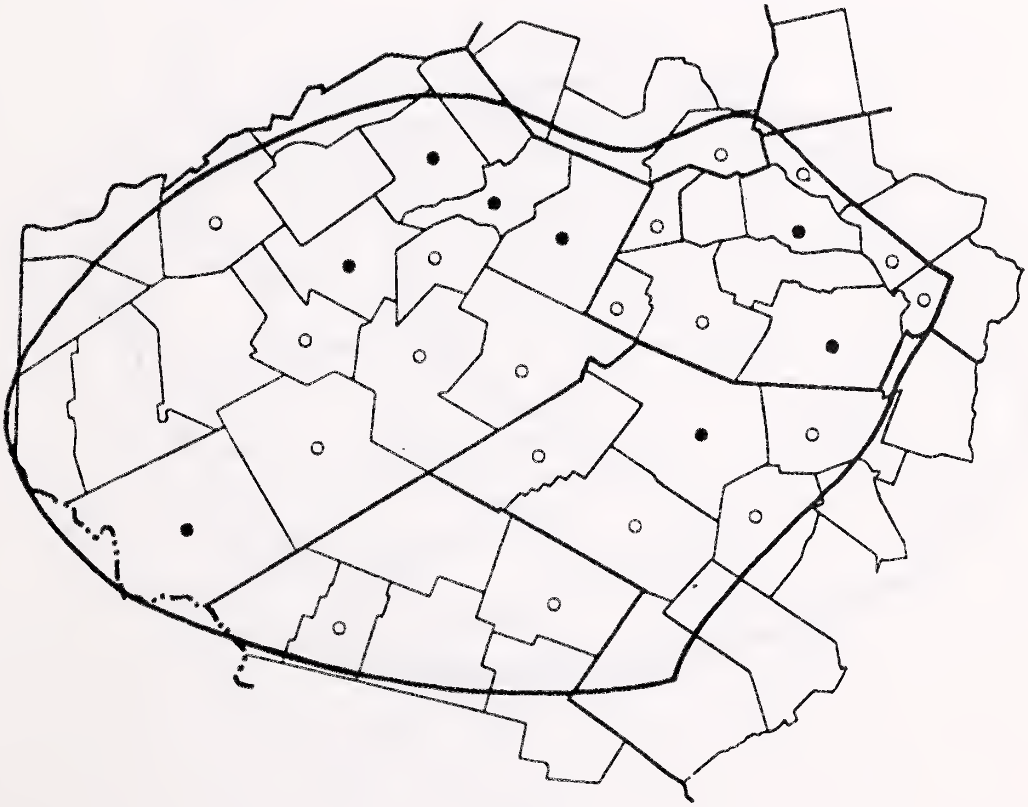
Hepatica nobilis Schreb.
var. acuta (Pursh) Steyer.
Sharp-lobed Hepatica



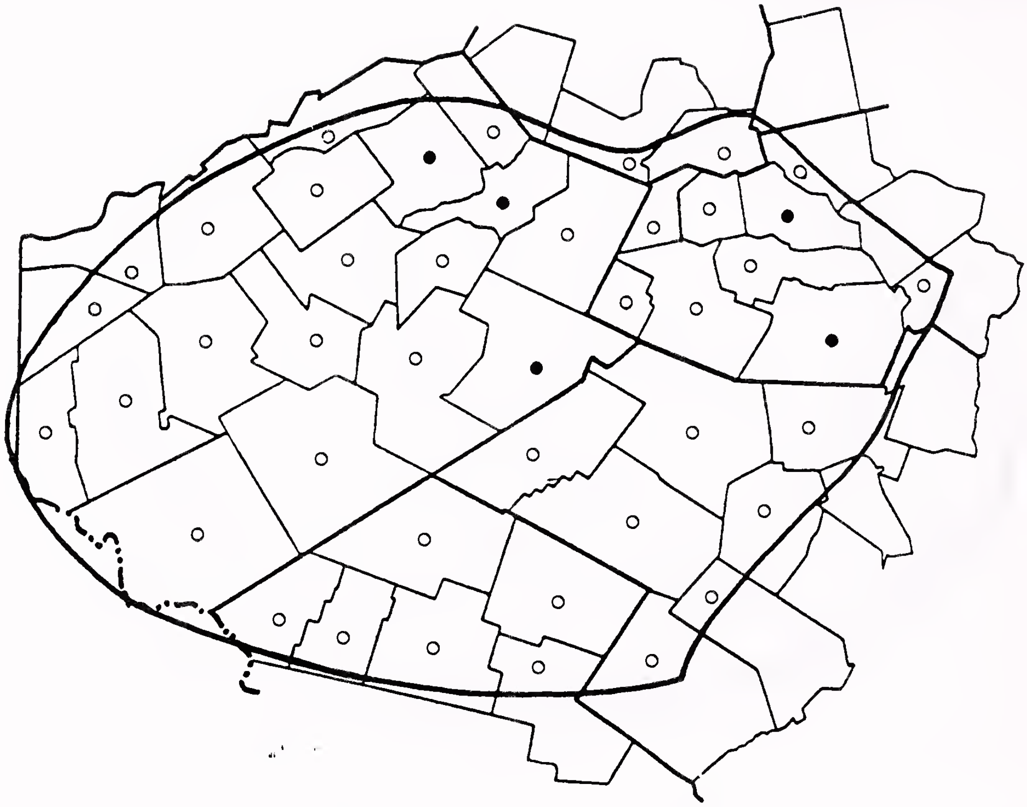
Hepatica nobilis Schreb.
var. obtusa (Pursh) Steyer.
Blunt-lobed Hepatica



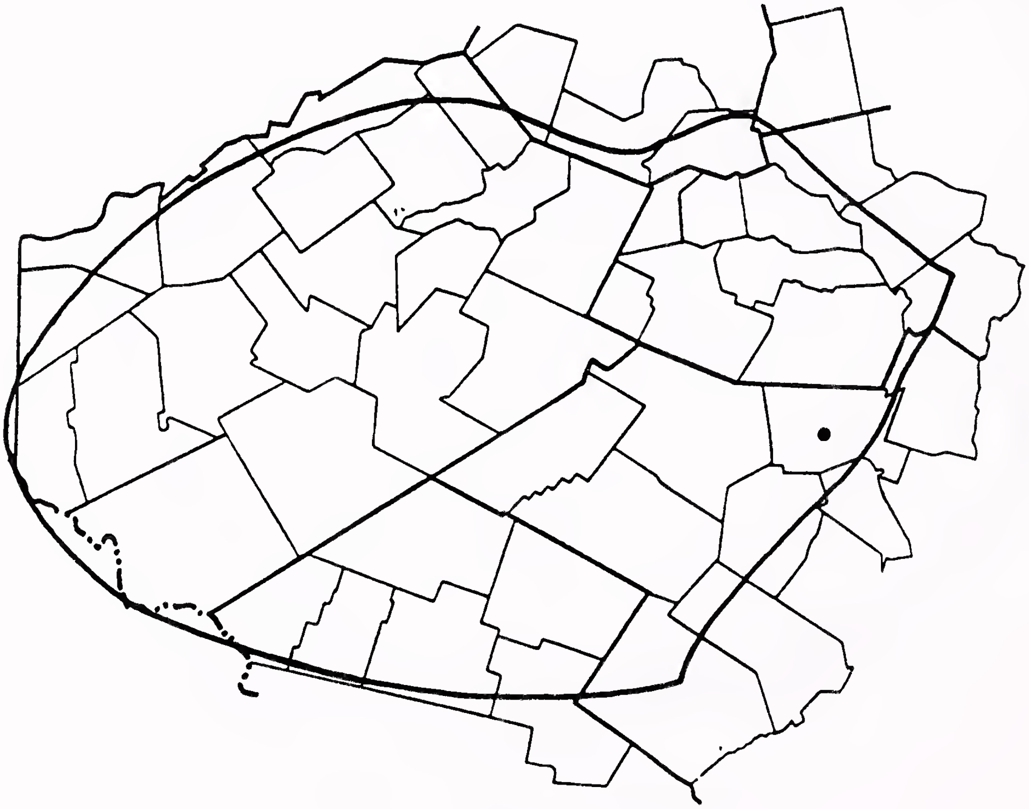
Ranunculus abortivus L.
Kidney-leaved Crowfoot



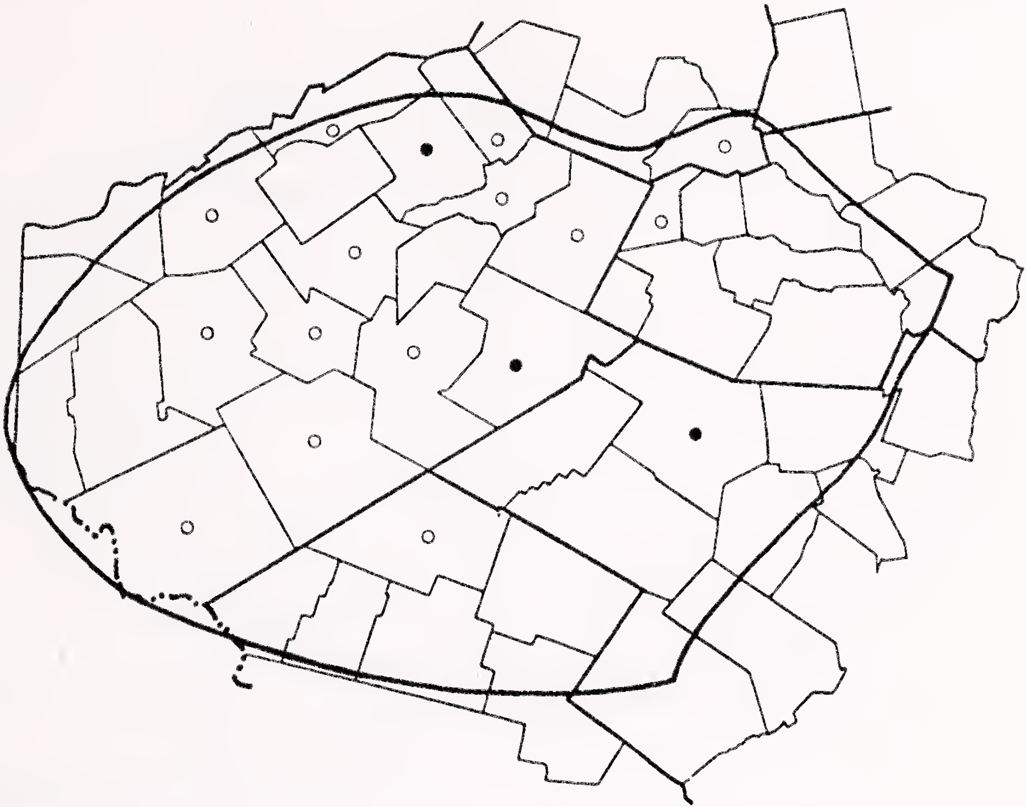
Ranunculus acris L.
Tall Field Buttercup



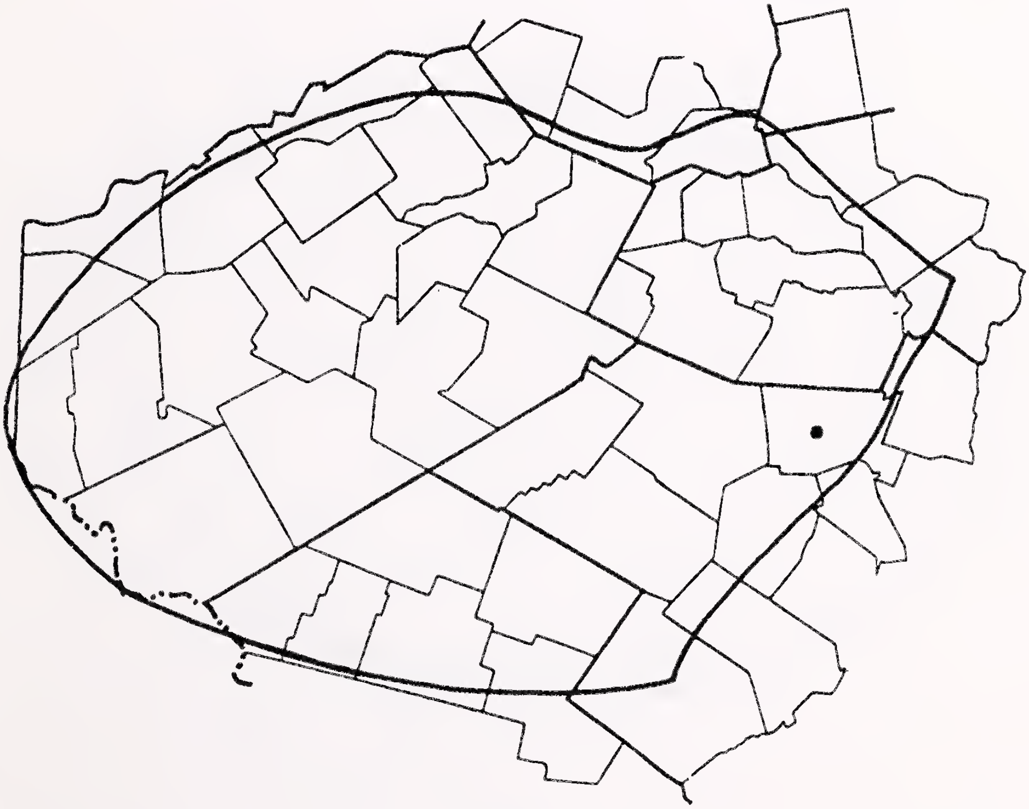
Ranunculus allegheniensis Britt.
Mountain Crowfoot



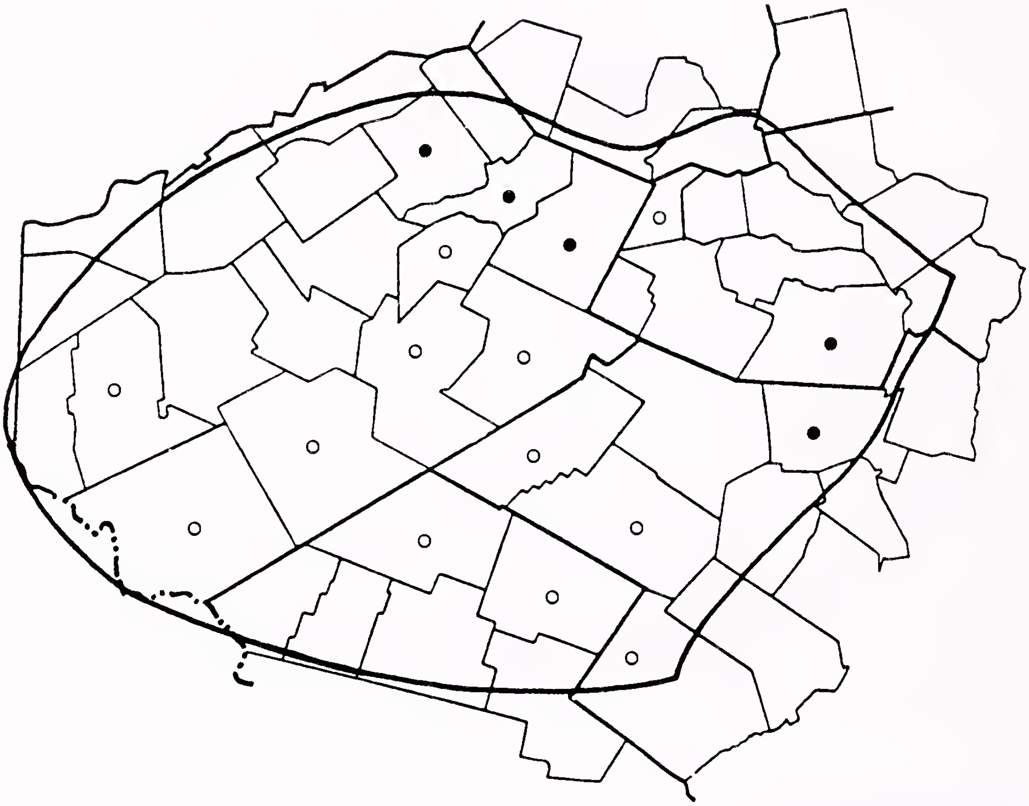
Ranunculus bulbosus L.
Bulbous Buttercup



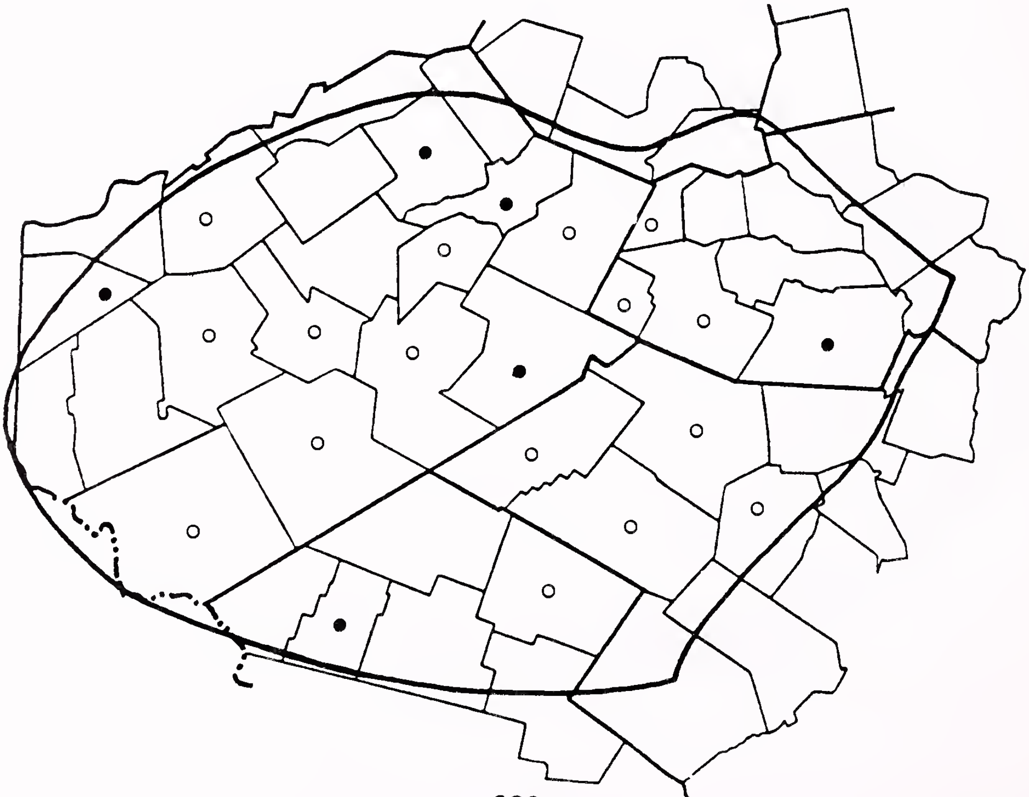
Ranunculus ficaria L.
Lesser Celandine



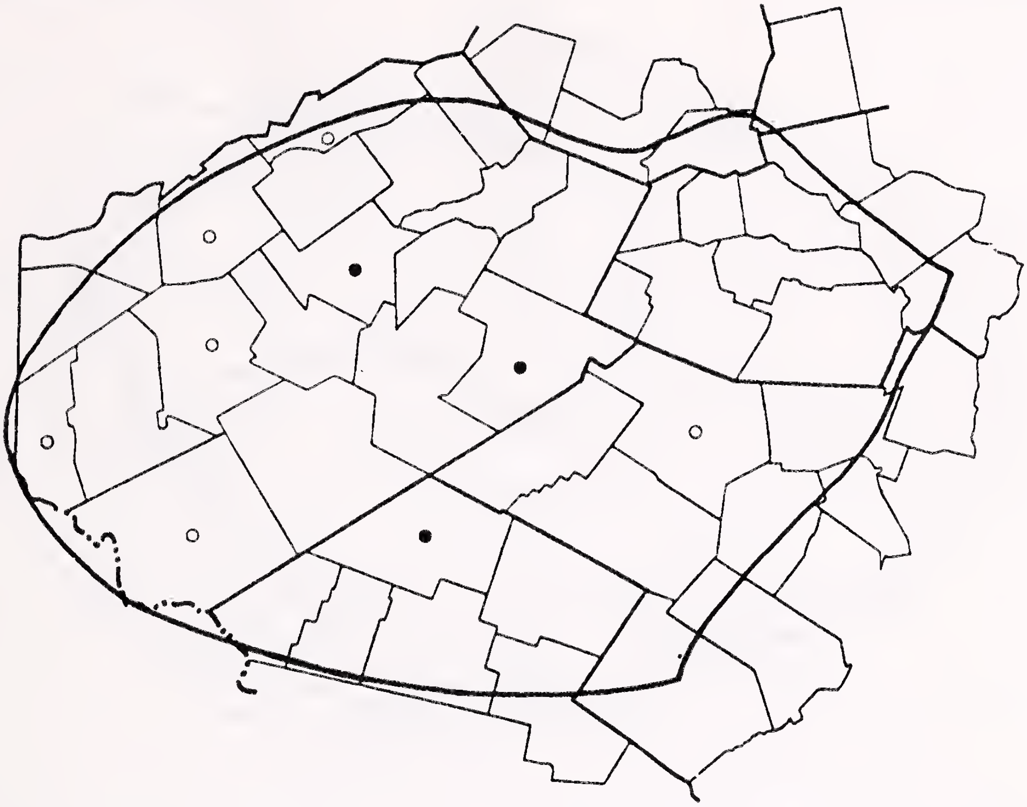
Ranunculus hispidus Michx.
var. caricetorum (Greene) Duncan
Swamp Buttercup



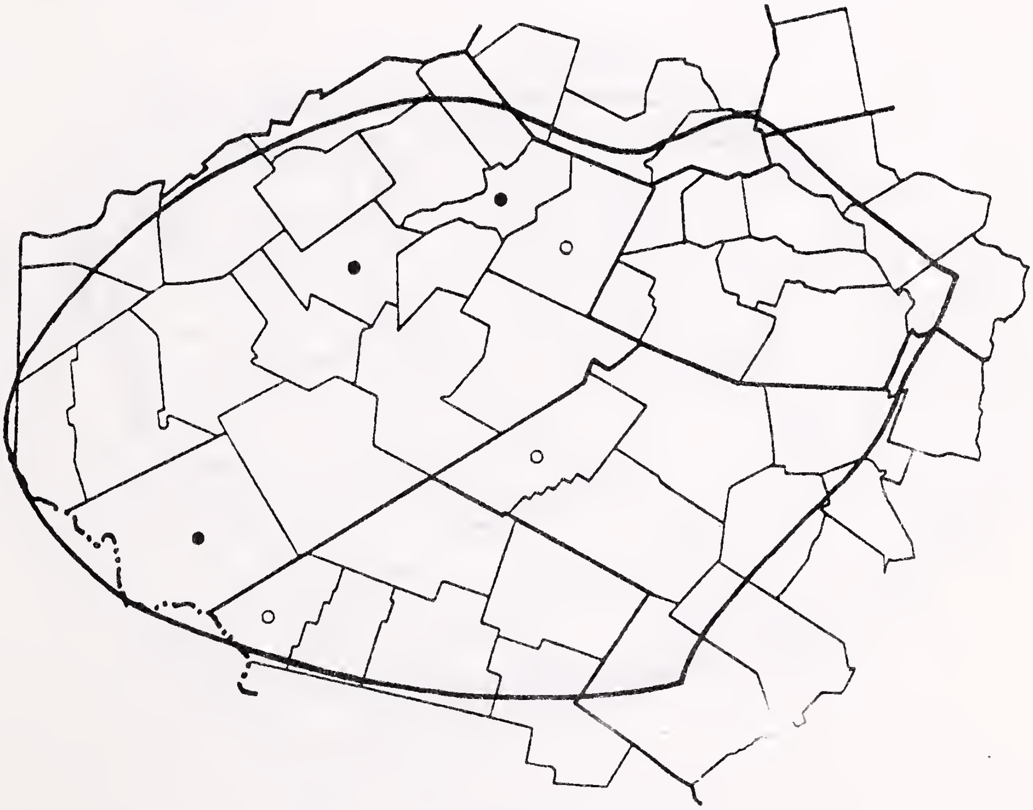
Ranunculus recurvatus Poir.
Hooked Crowfoot



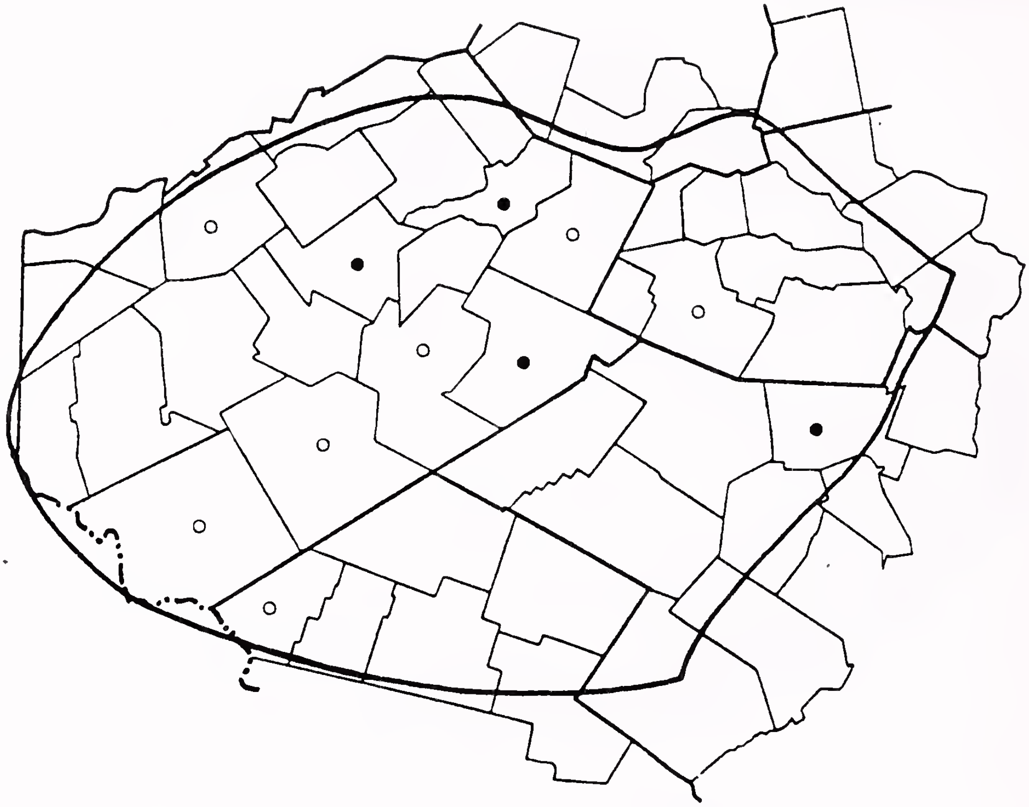
Ranunculus repens L.
Creeping Buttercup



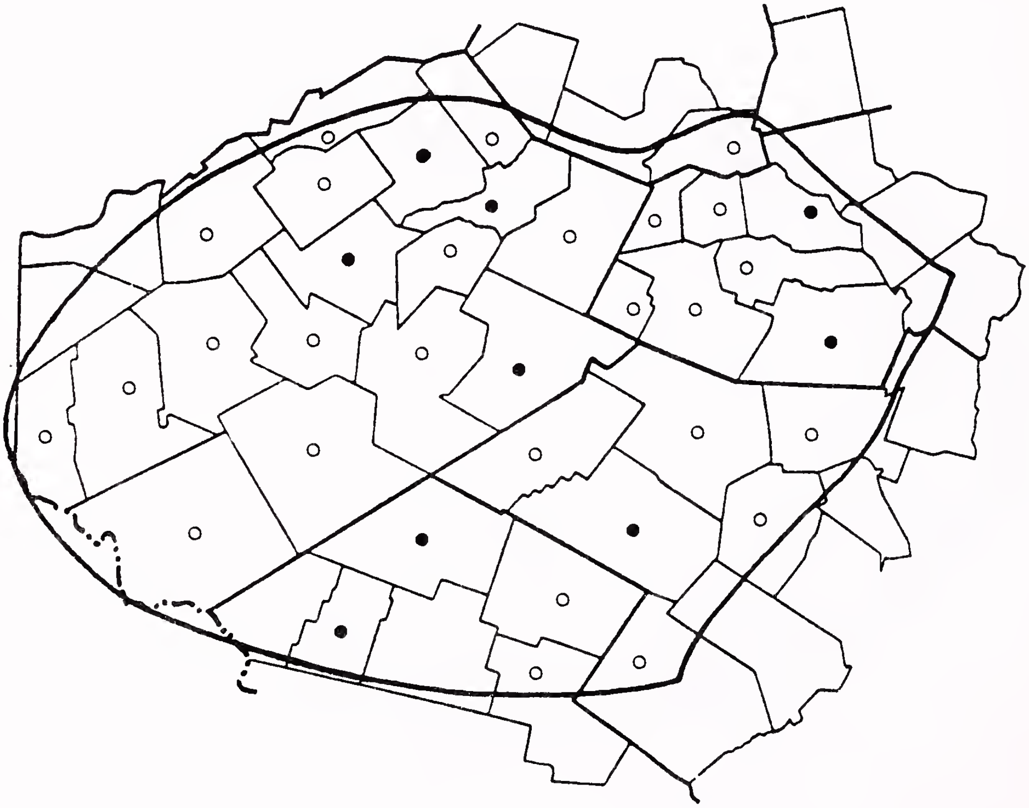
Ranunculus trichophyllus Chaix
White Water-crowfoot



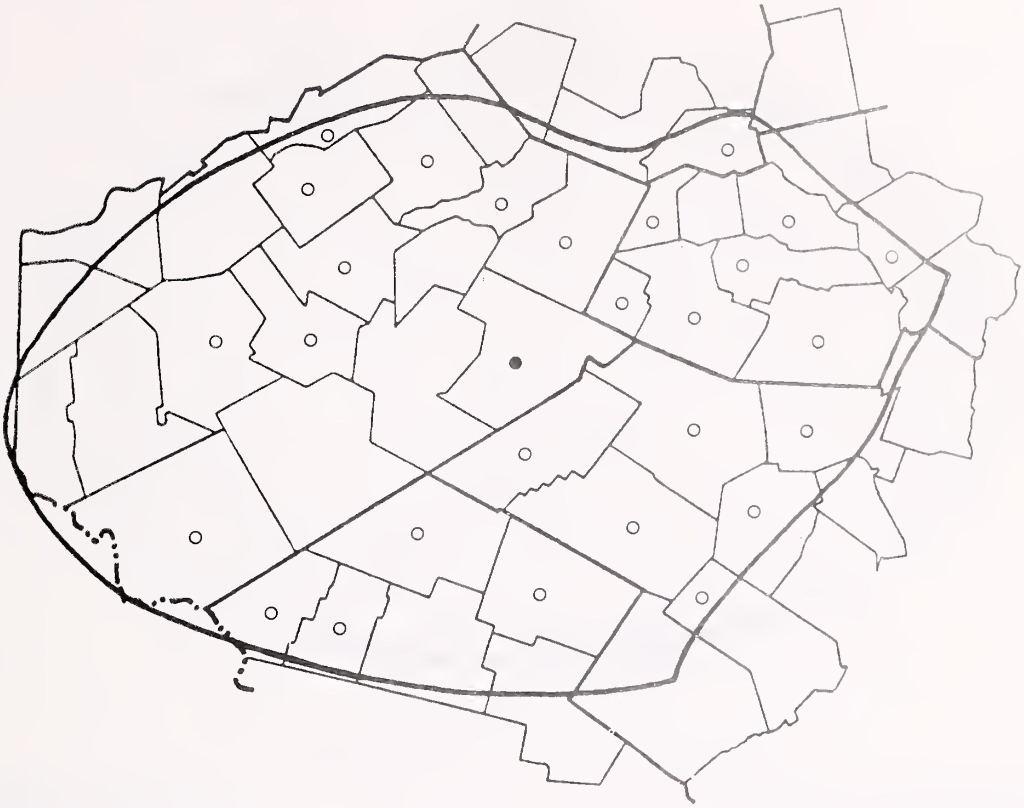
Thalictrum dioicum L.
Early Meadow-rue



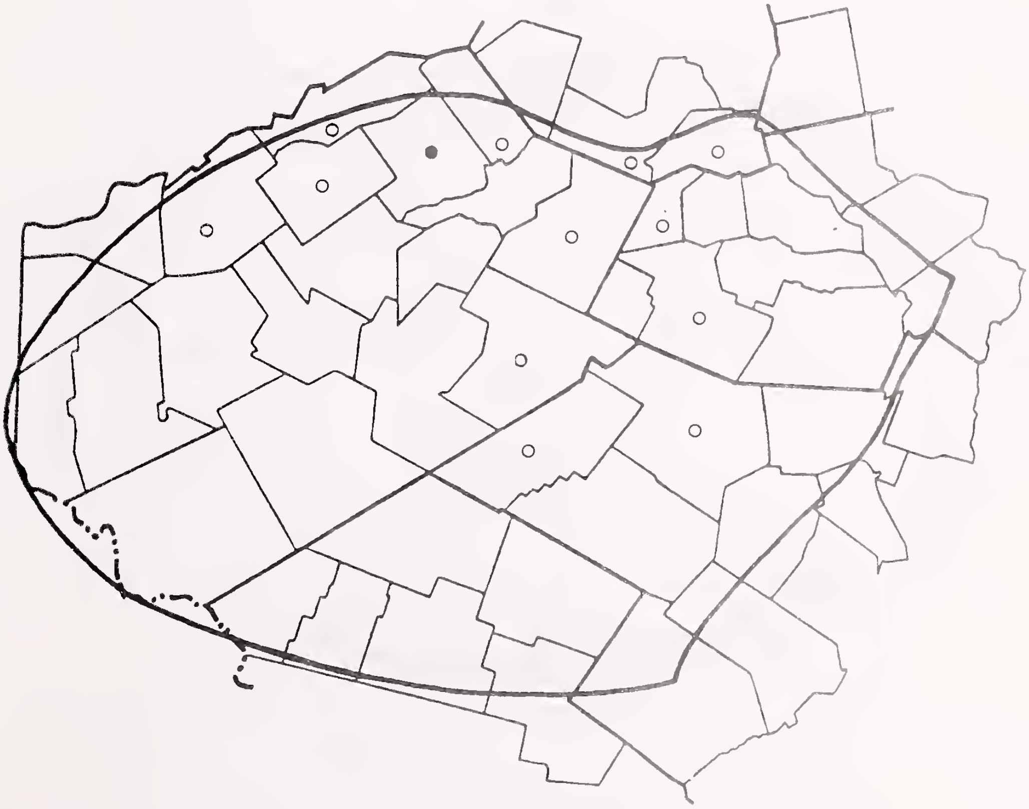
Thalictrum pubescens Pursh
Late Meadow-rue



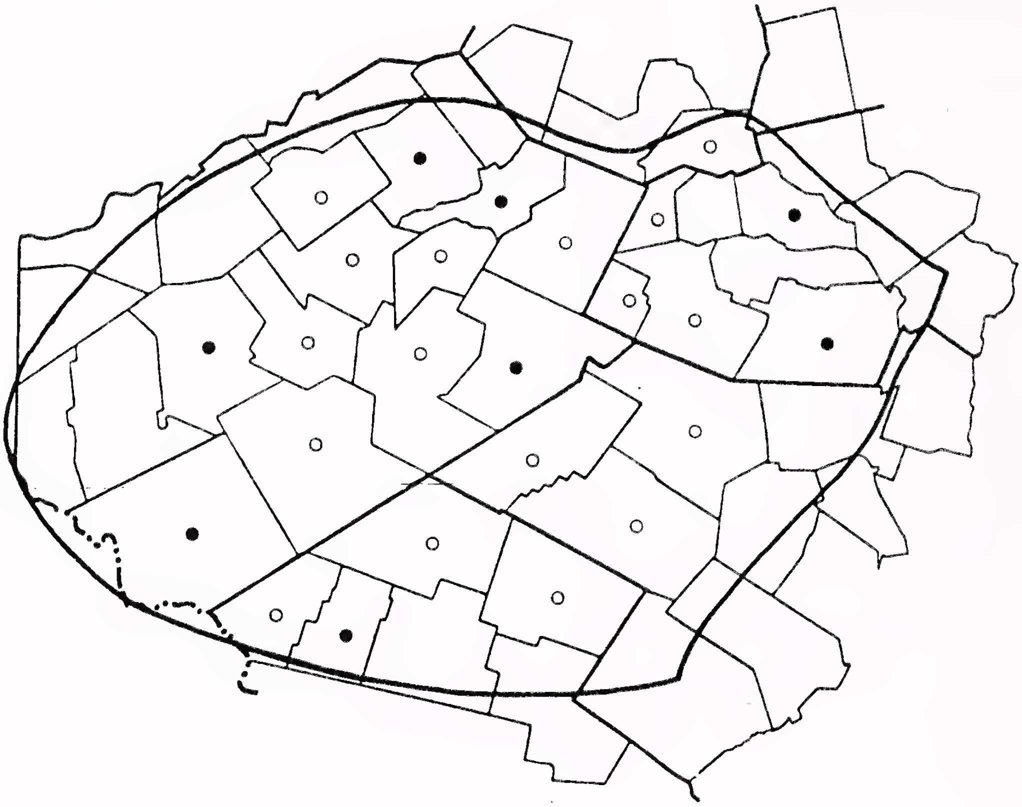
Berberis thunbergii DC.
Japanese Barberry



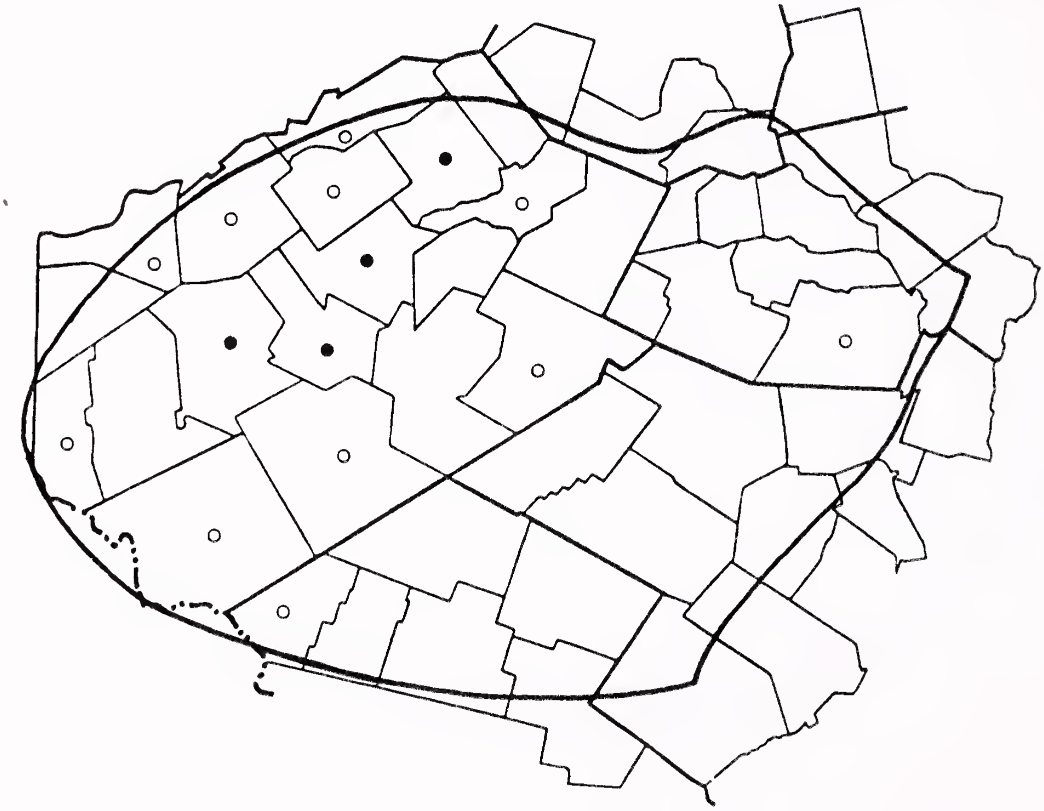
Berberis vulgaris L.
European Barberry



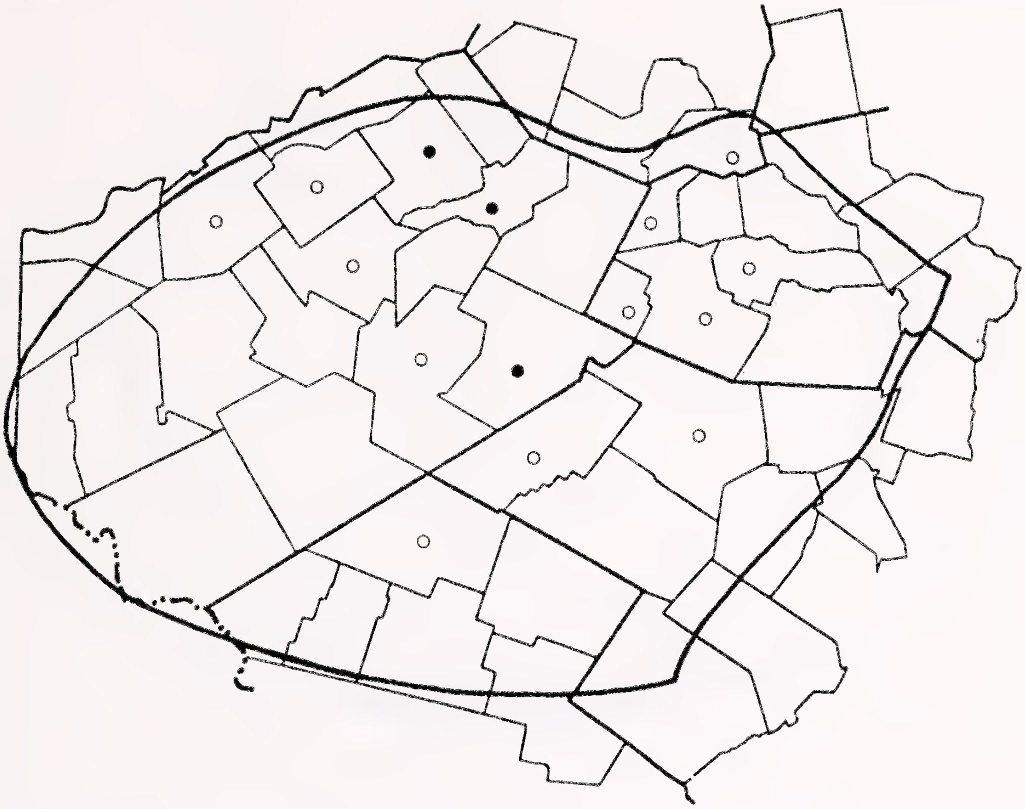
Caulophyllum thalictroides (L.) Michx.
Blue Cohosh



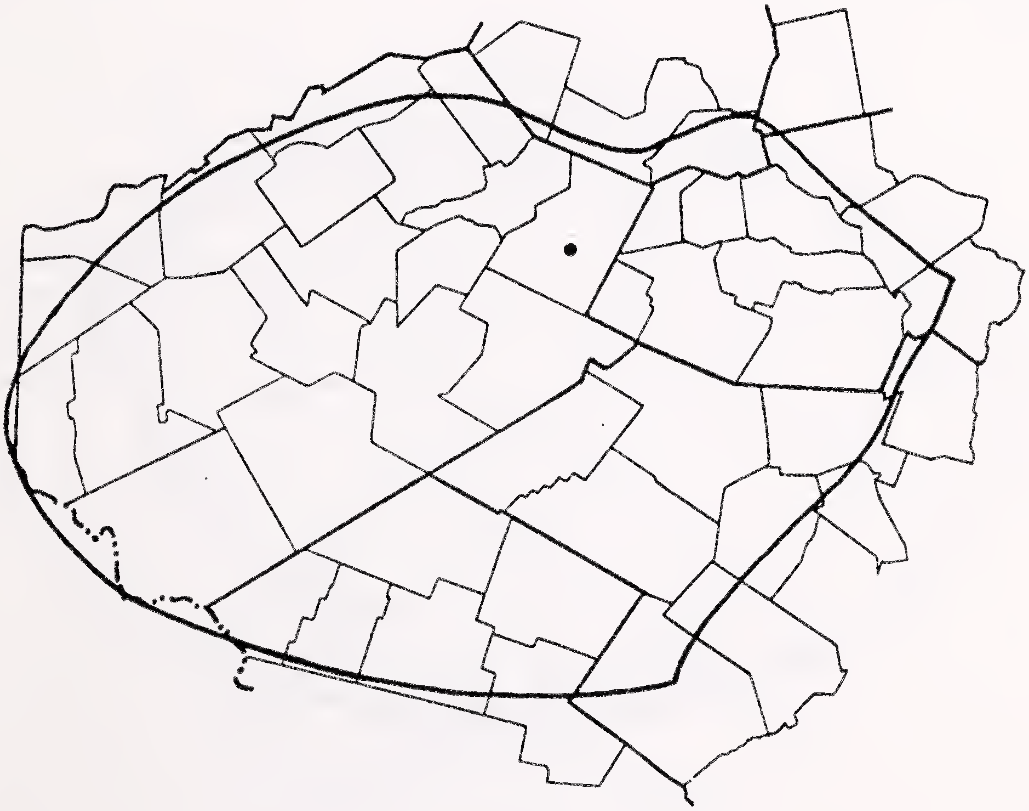
Podophyllym peltatum L.
May Apple



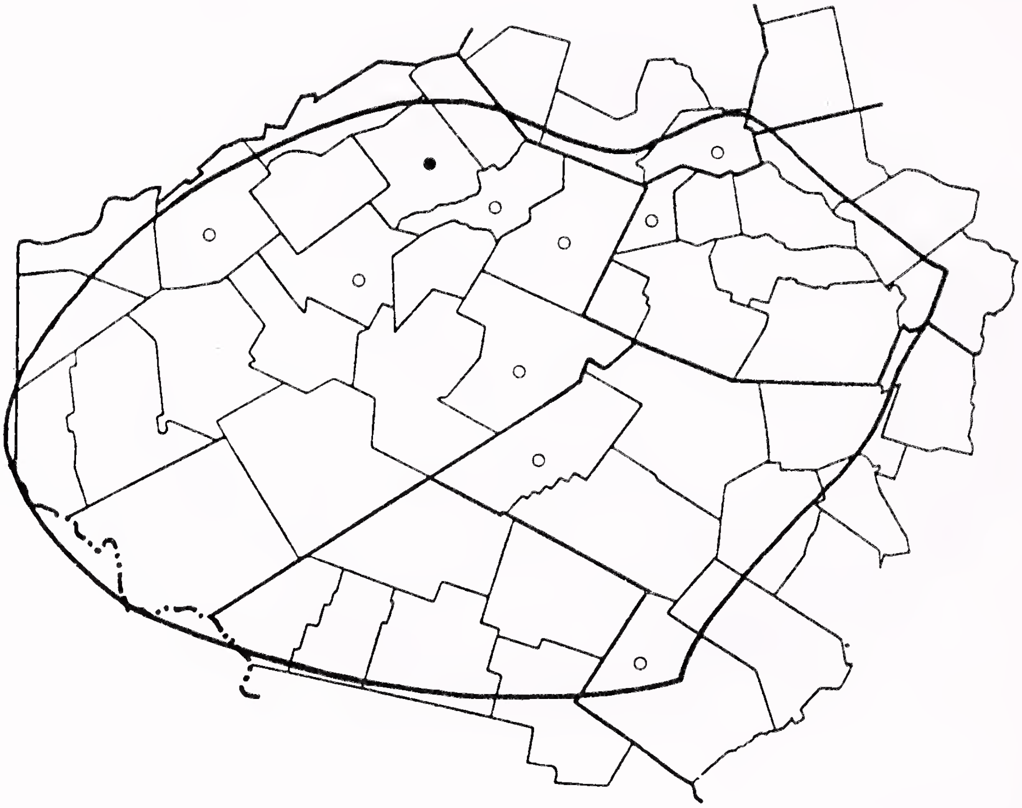
Chelidonium majus L.
Celandine



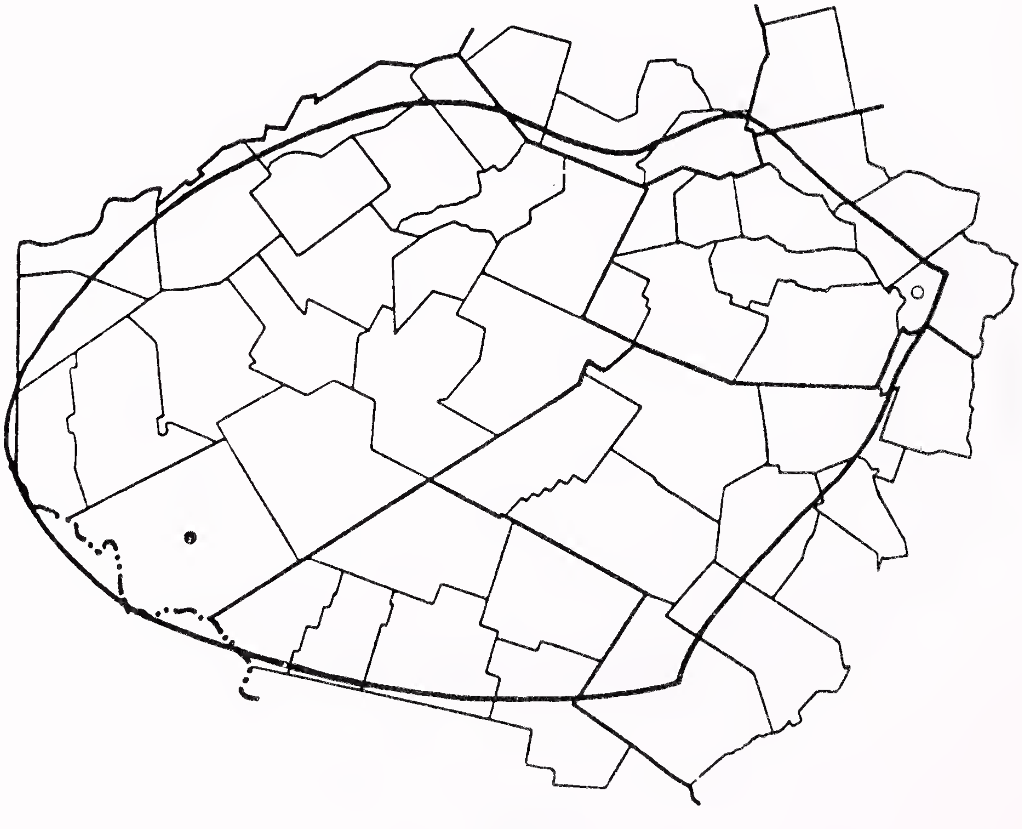
Papaver rhoeas L.
Corn Poppy



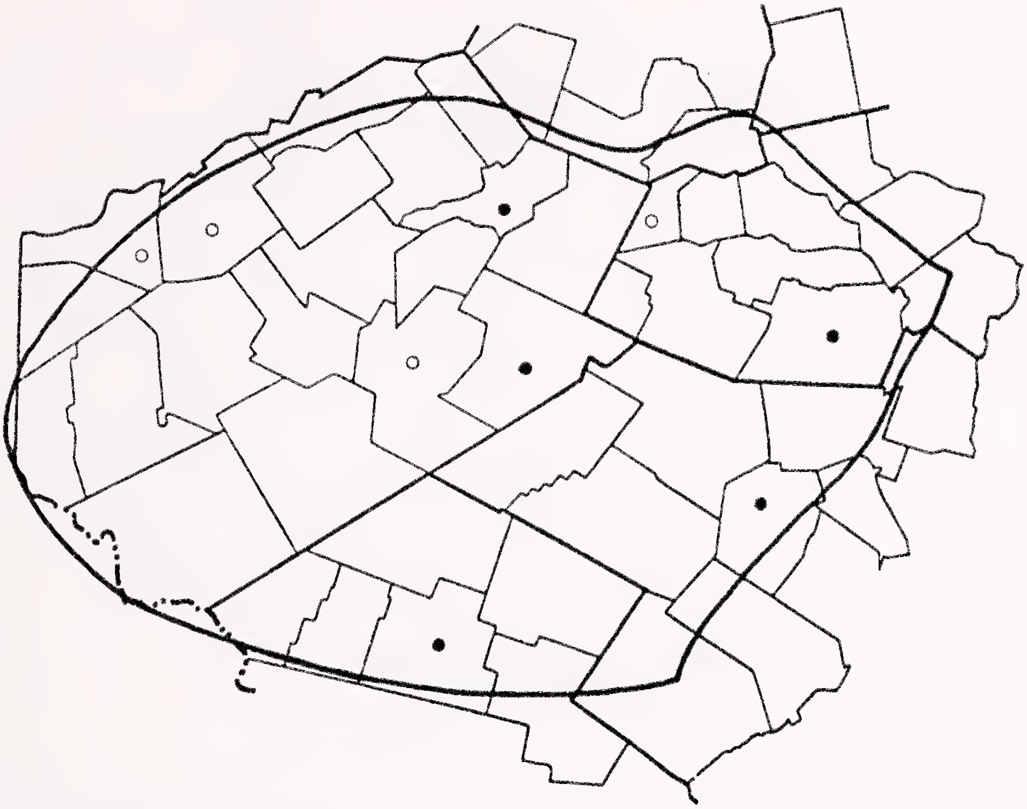
Sanguinaria canadensis L.
Bloodroot



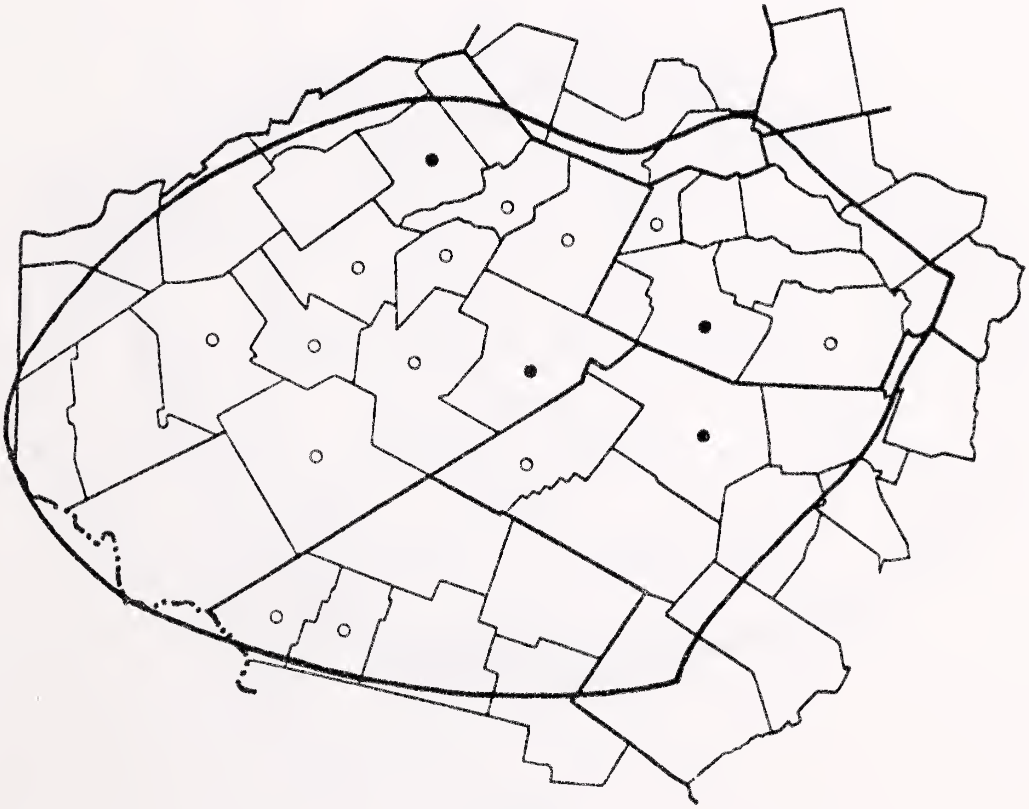
Adlumia fungosa (Ait.) Greene
Alleghany-vine



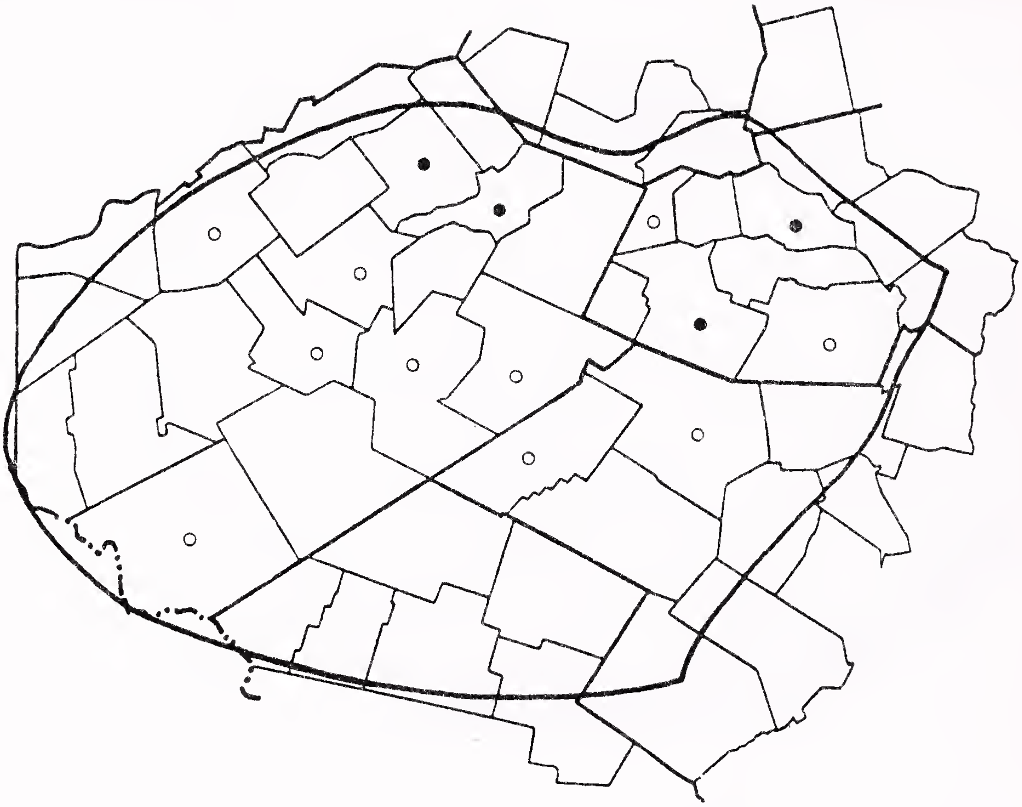
Corydalis sempervirens (L.) Pers.
Pale Corydalis



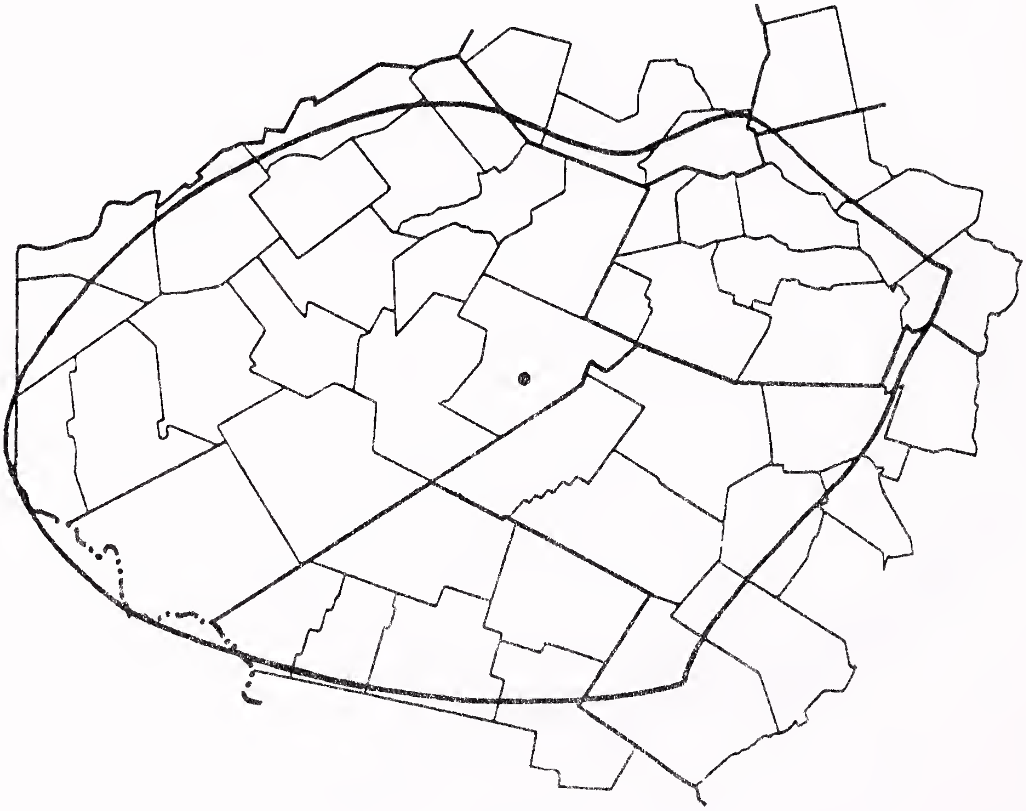
Dicentra canadensis (Goldie) Walp.
Squirrel-corn



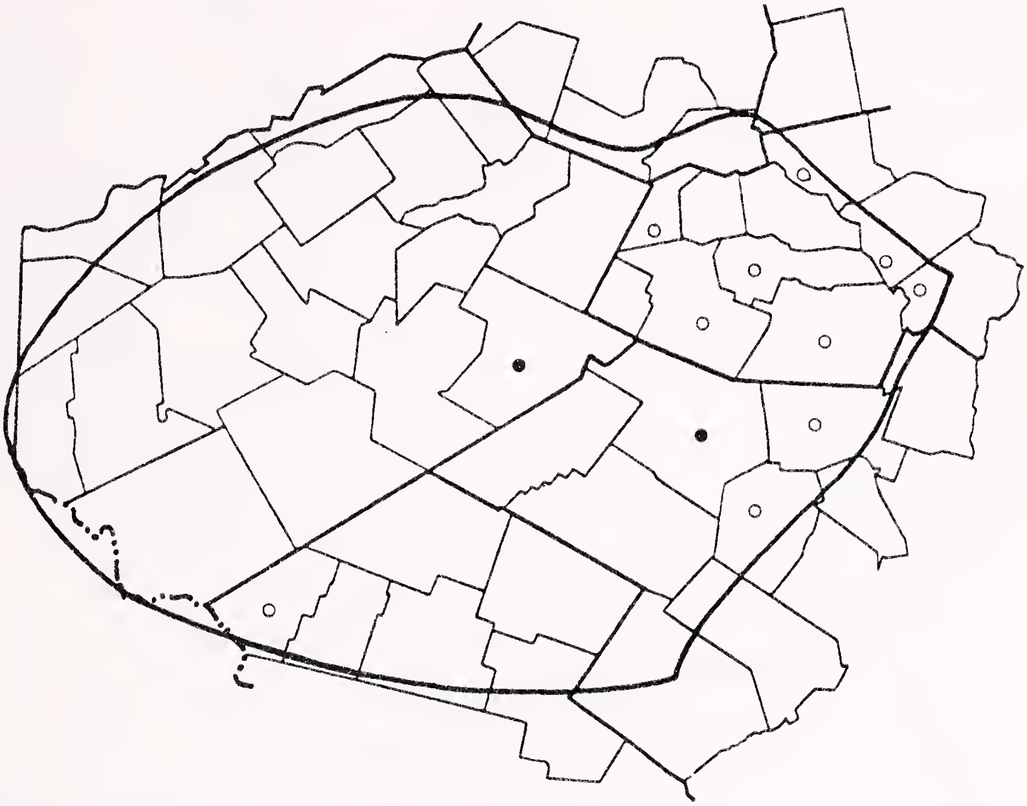
Dicentra cucullaria (L.) Bernh.
Dutchman's Breeches



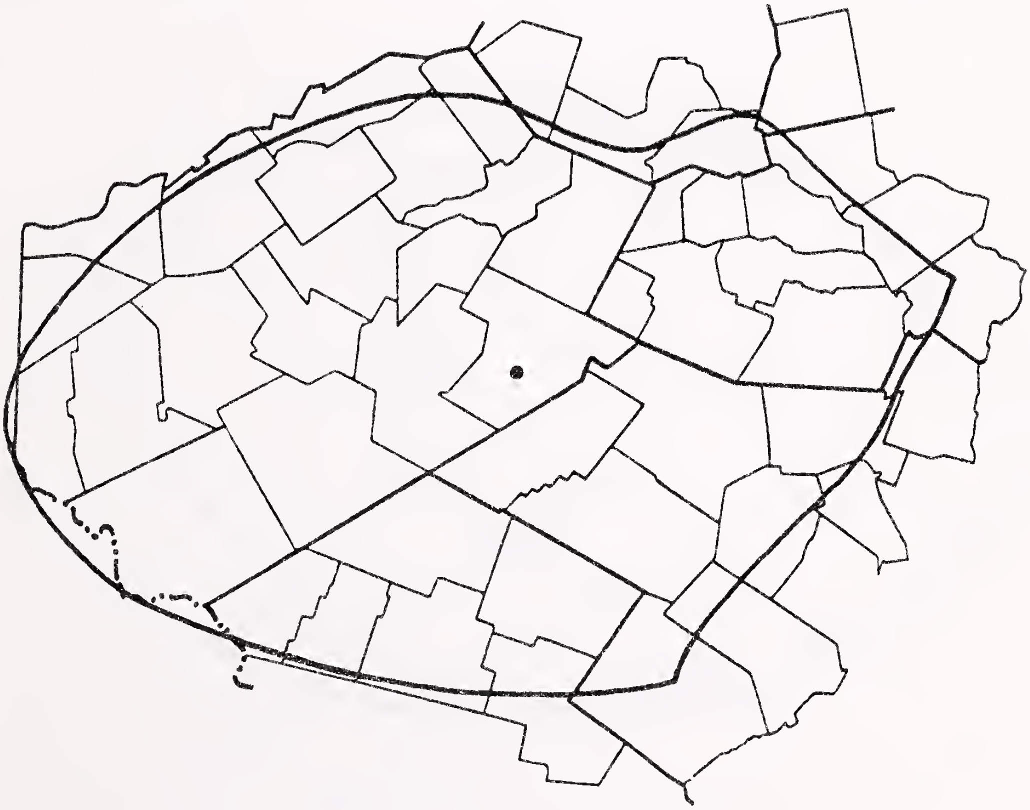
Fumaria officinalis L.
Earth-smoke



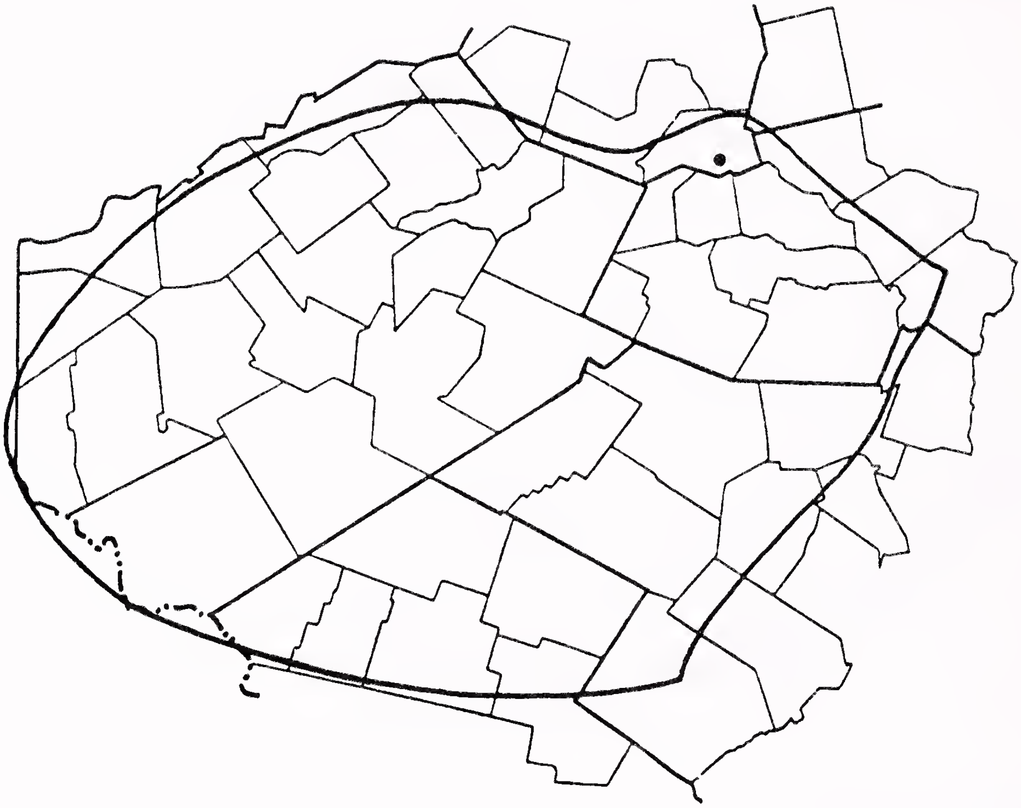
Alliaria petiolata (Cav.) Bieb.
Garlic-mustard



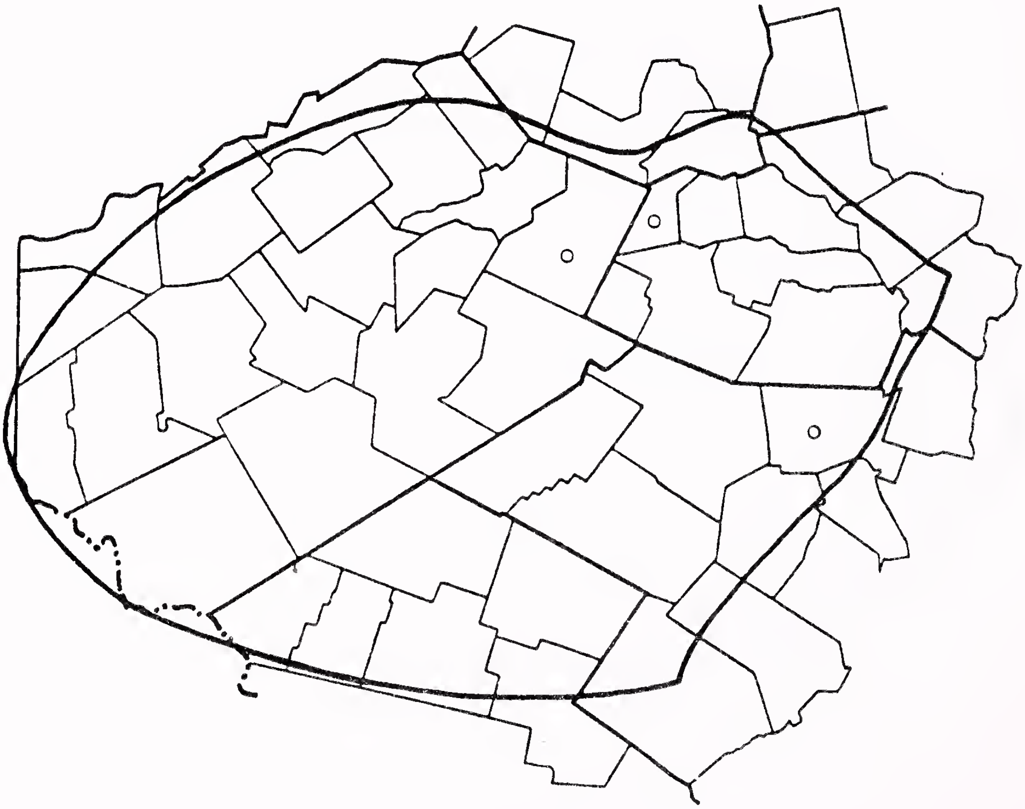
Alyssum alyssoides L.
Small Alyssum



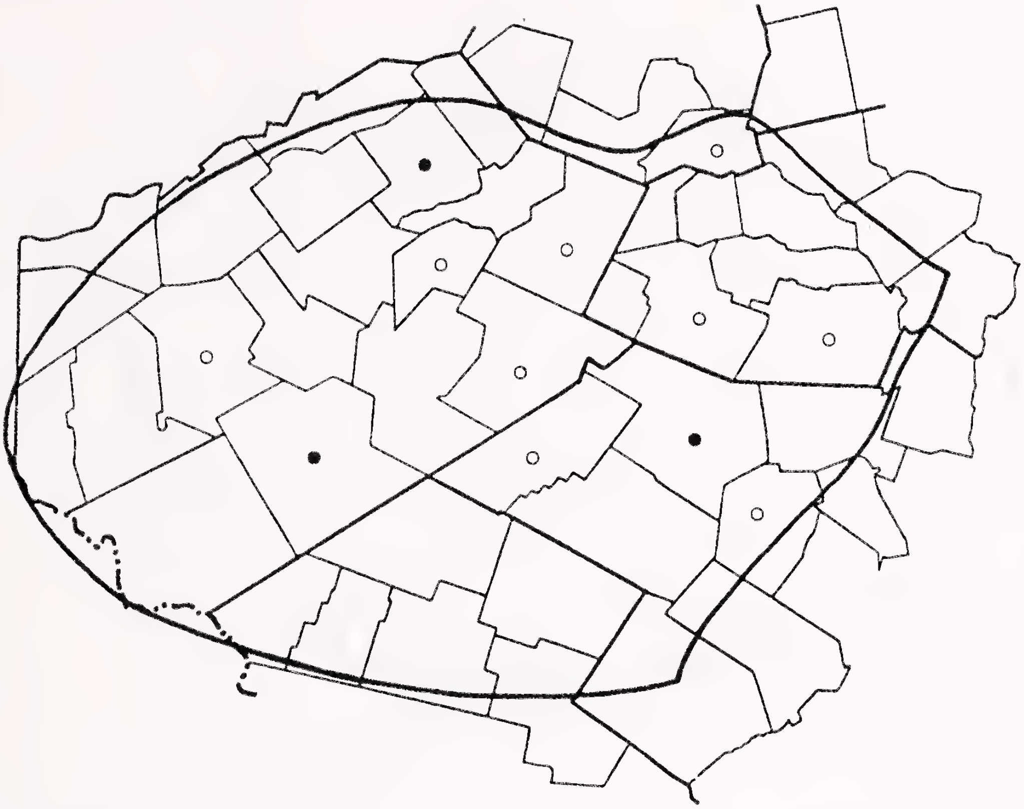
Arabidopsis thaliana (L.) Heynh.
Mouse-eared Cress



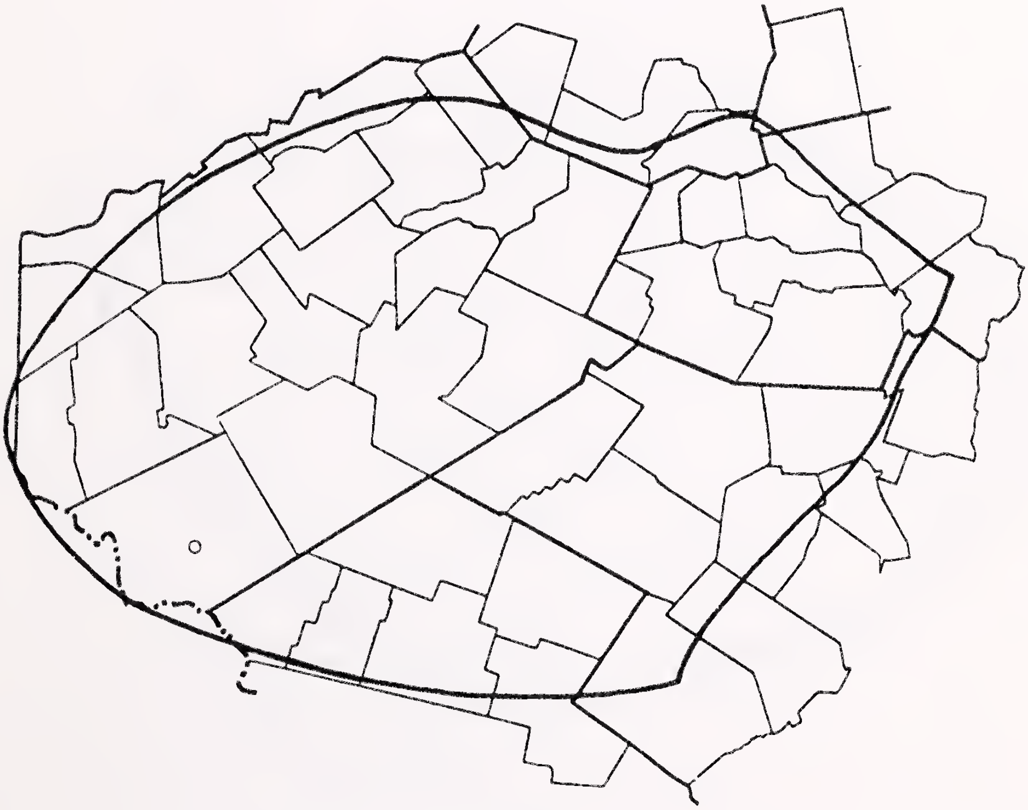
Arabis canadensis L.
Sicklepod



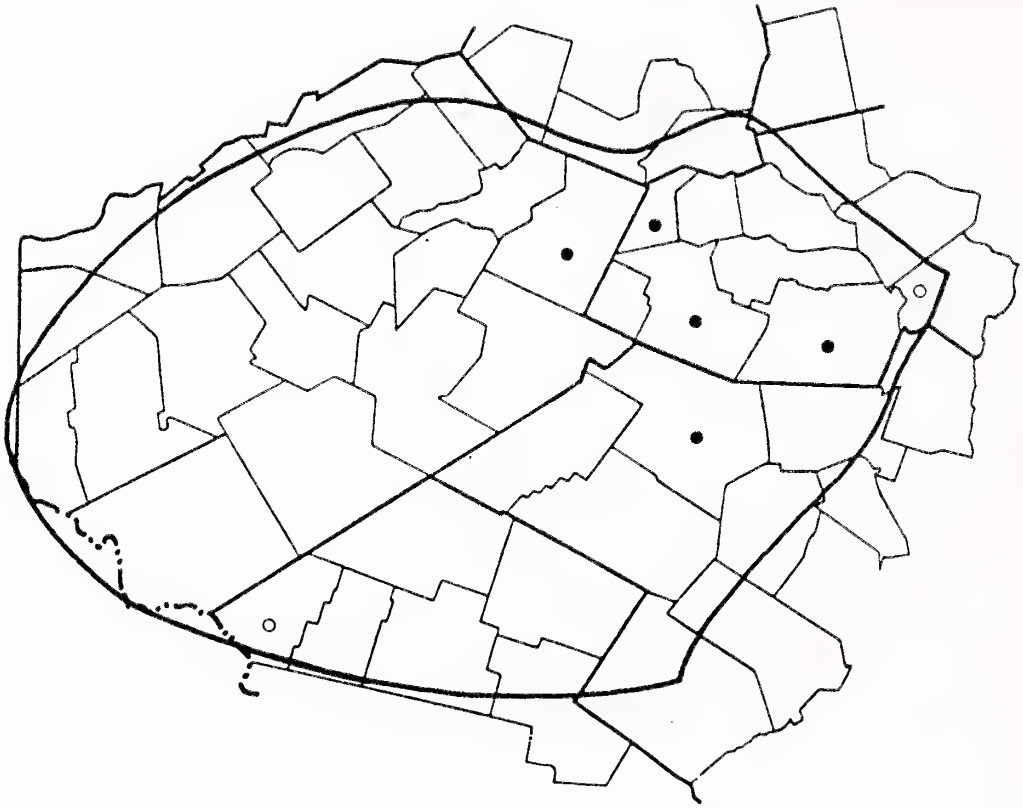
Arabis glabra (L.) Bernh.
Tower-mustard



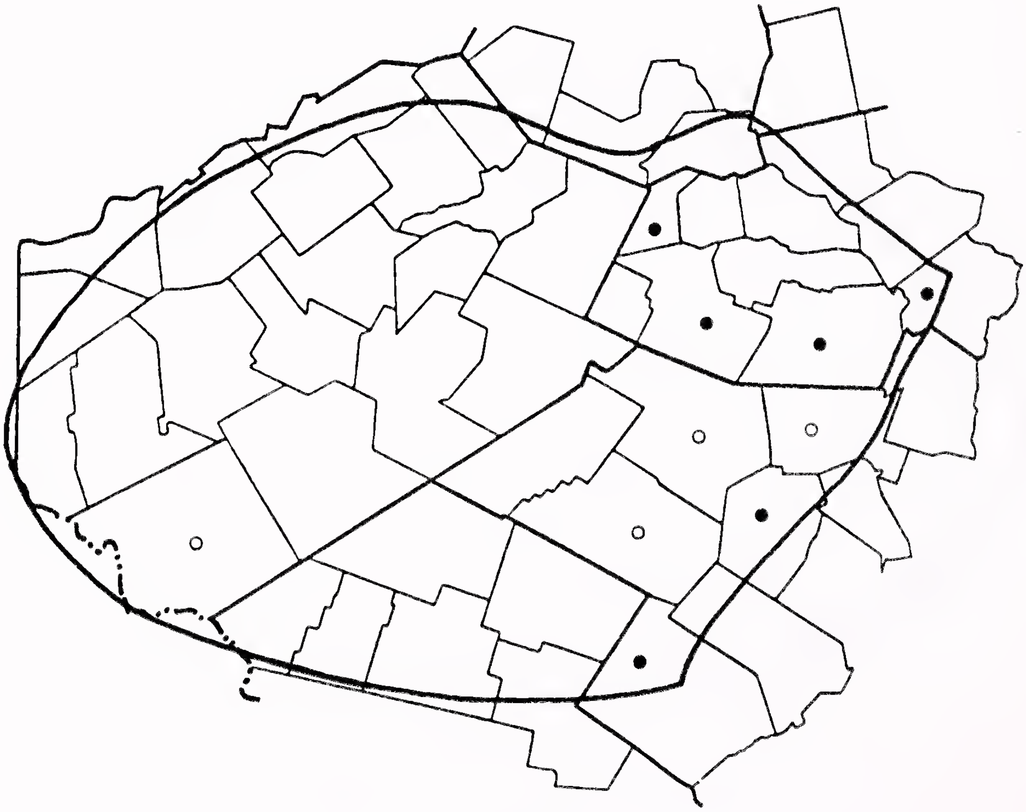
Arabis hirsuta (L.) Scop.
Hairy Rock-cress



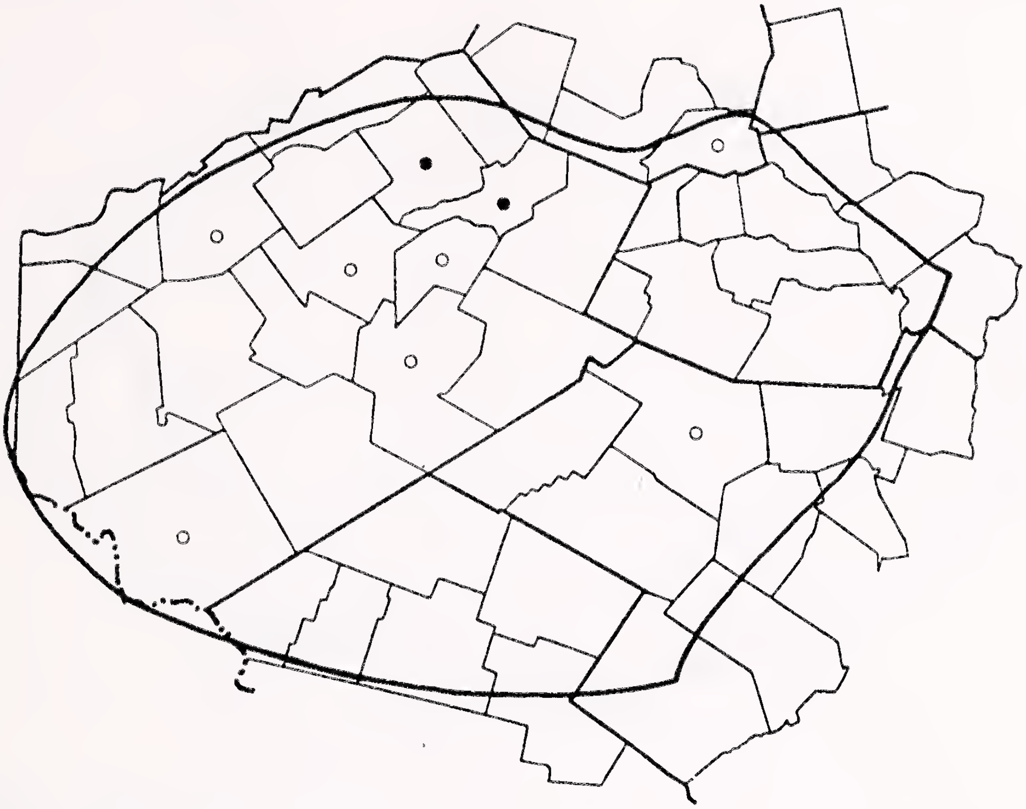
Arabis laevigata (Muhl.) Poir.
Smooth Rock-cress



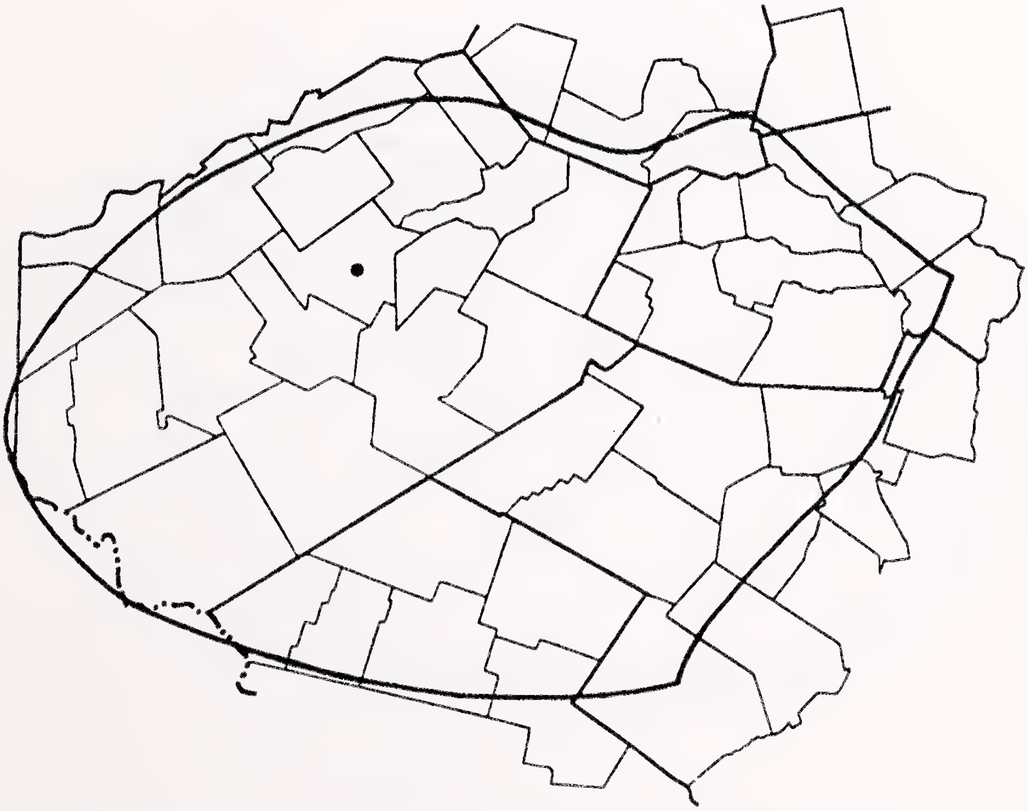
Arabis lyrata L.
Lyre-leaved Rock-cress



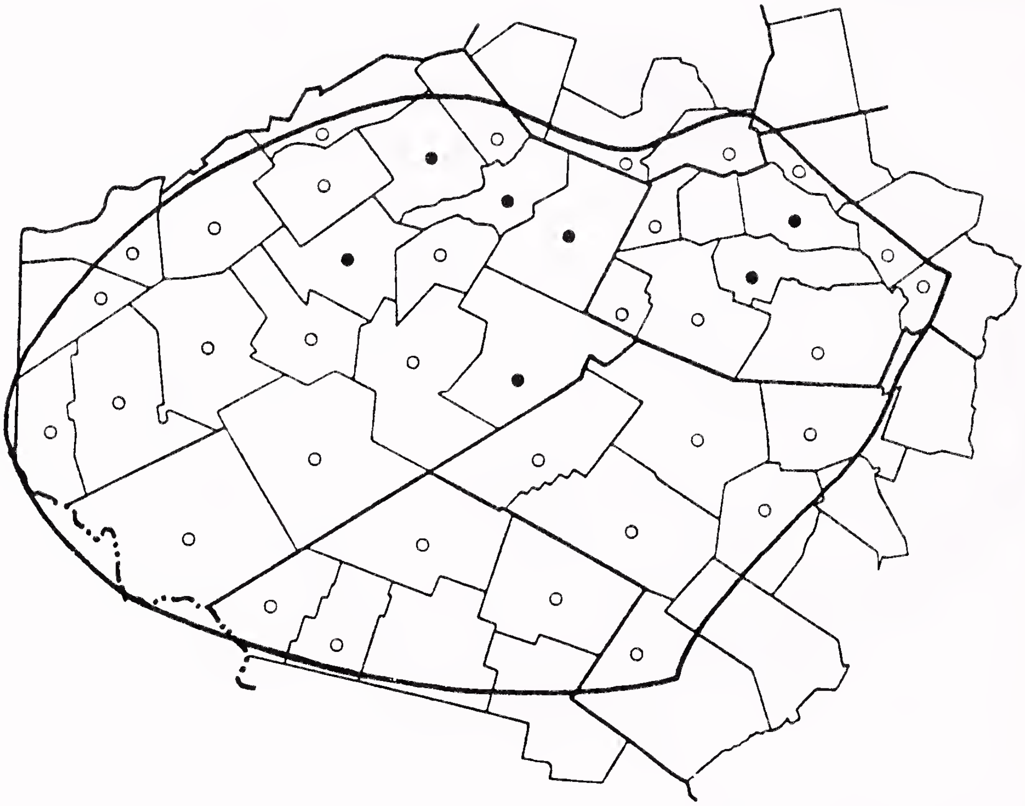
Armoracia lapathifolia Gilib.
Horseradish



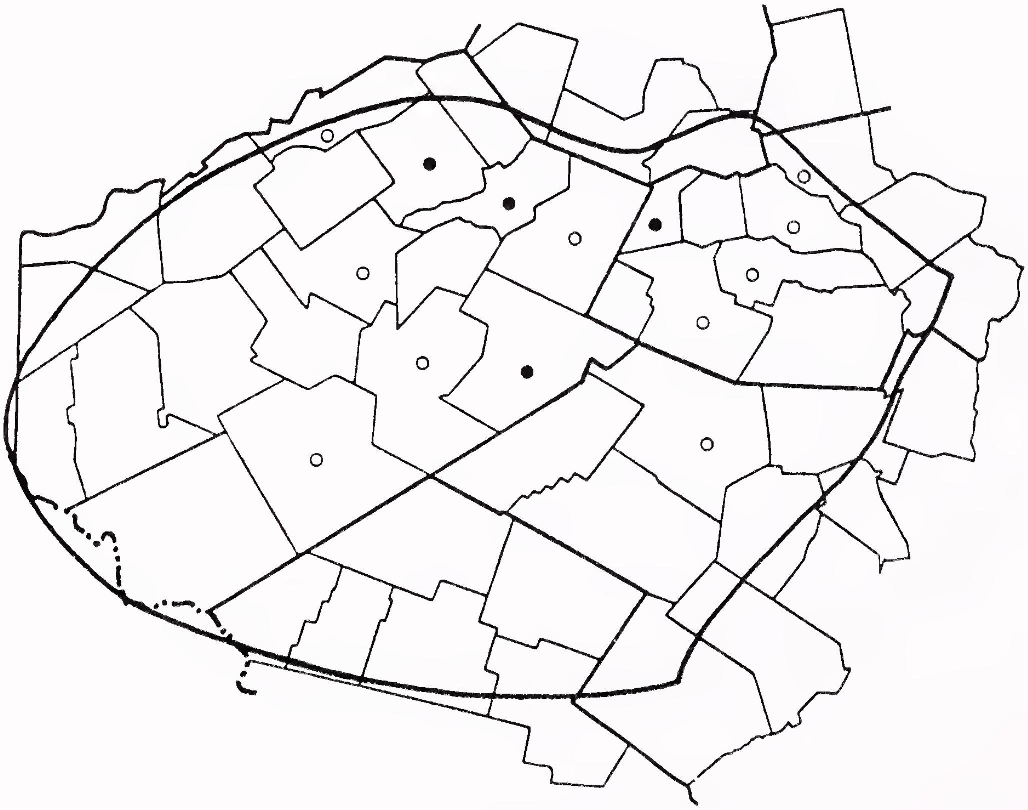
Barbarea verna (Mill.) Aschers.
Early Winter Cress



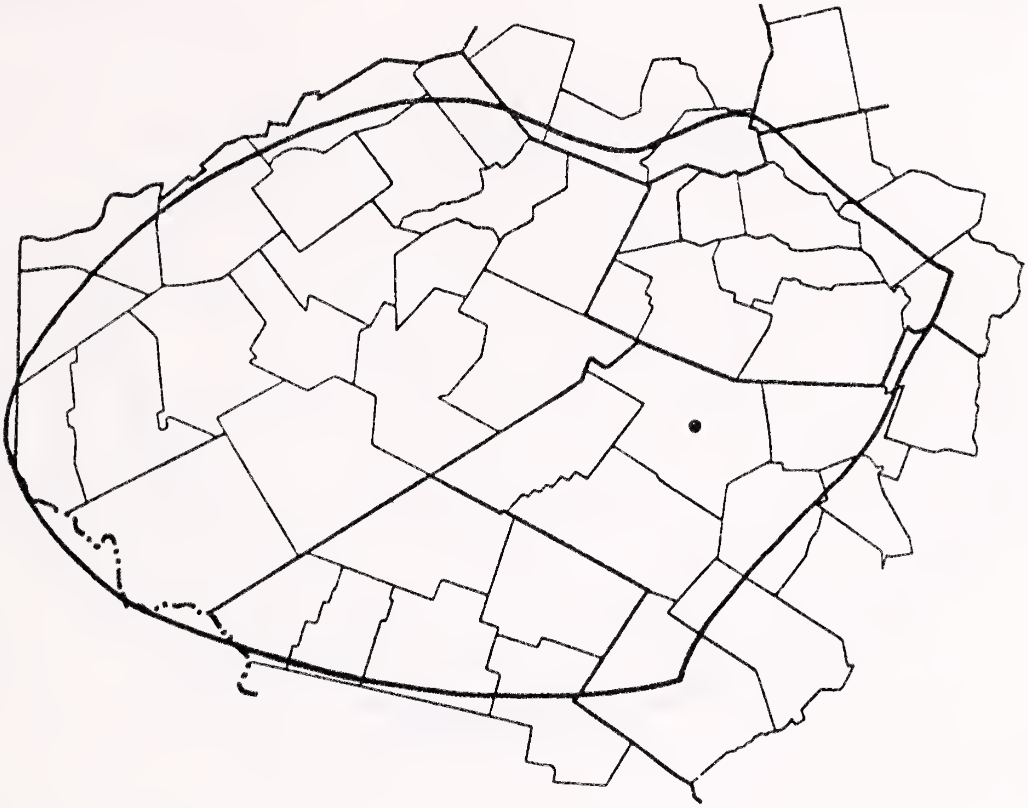
Barbarea vulgaris R. Br.
Winter Cress



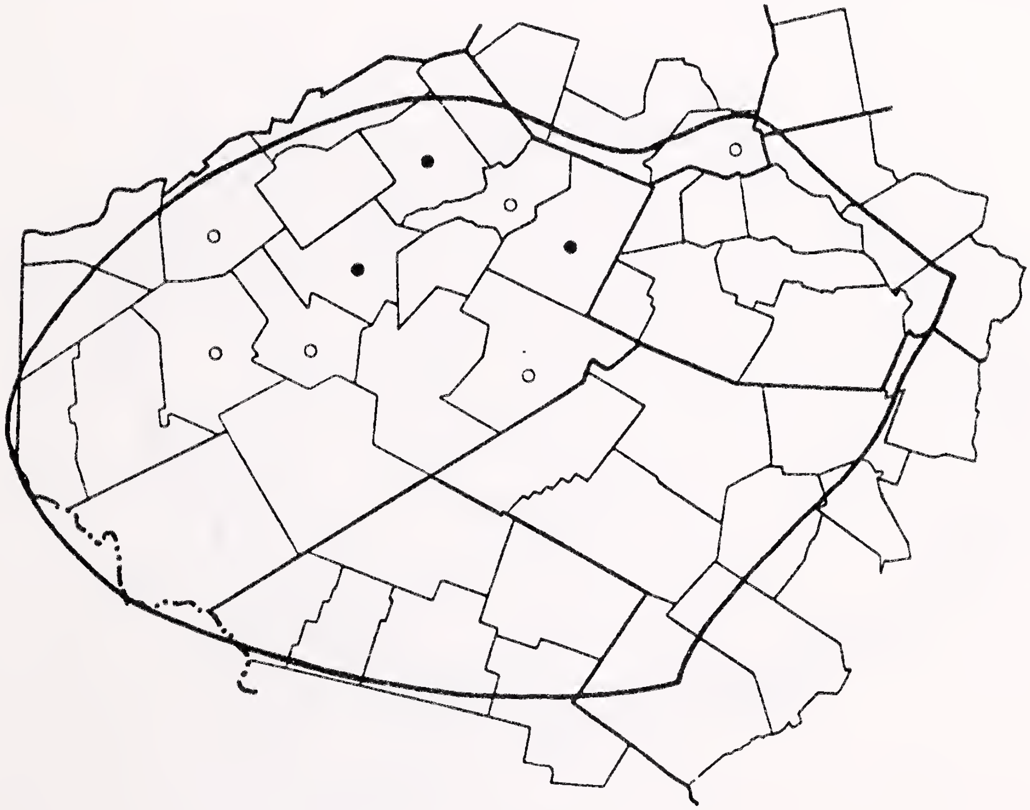
Berteroa incana (L.) DC.
Hoary Alyssum



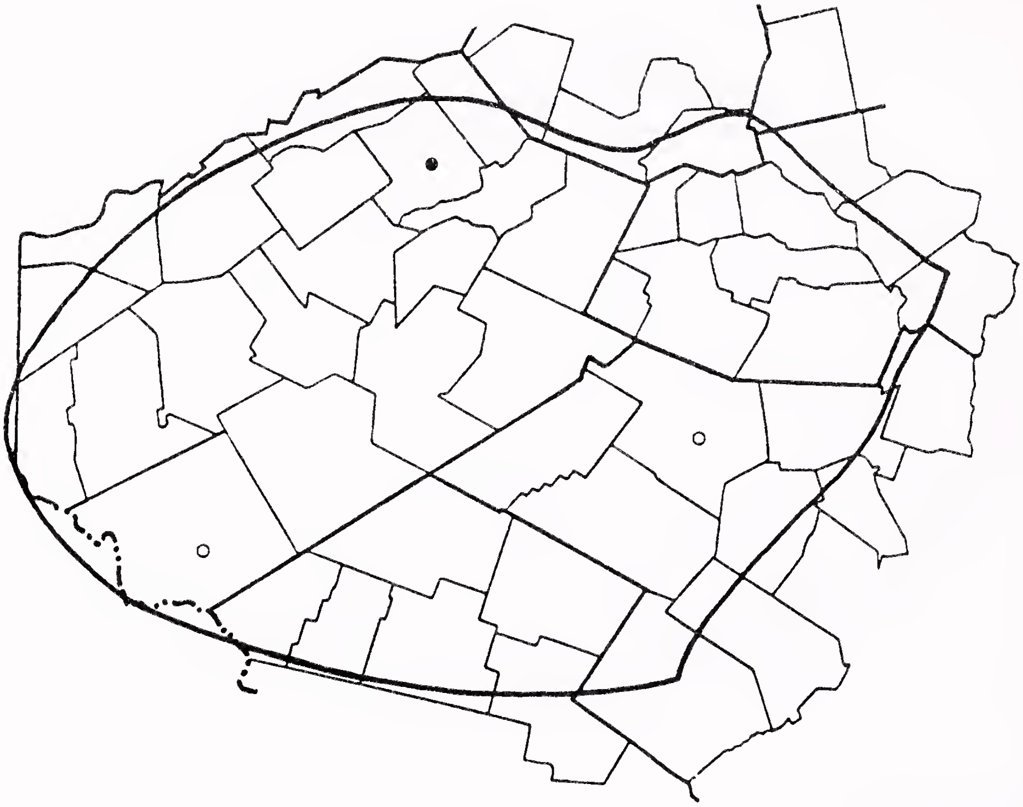
Berteroa obliqua (Sibth. & Sm.) DC.
Berteroa



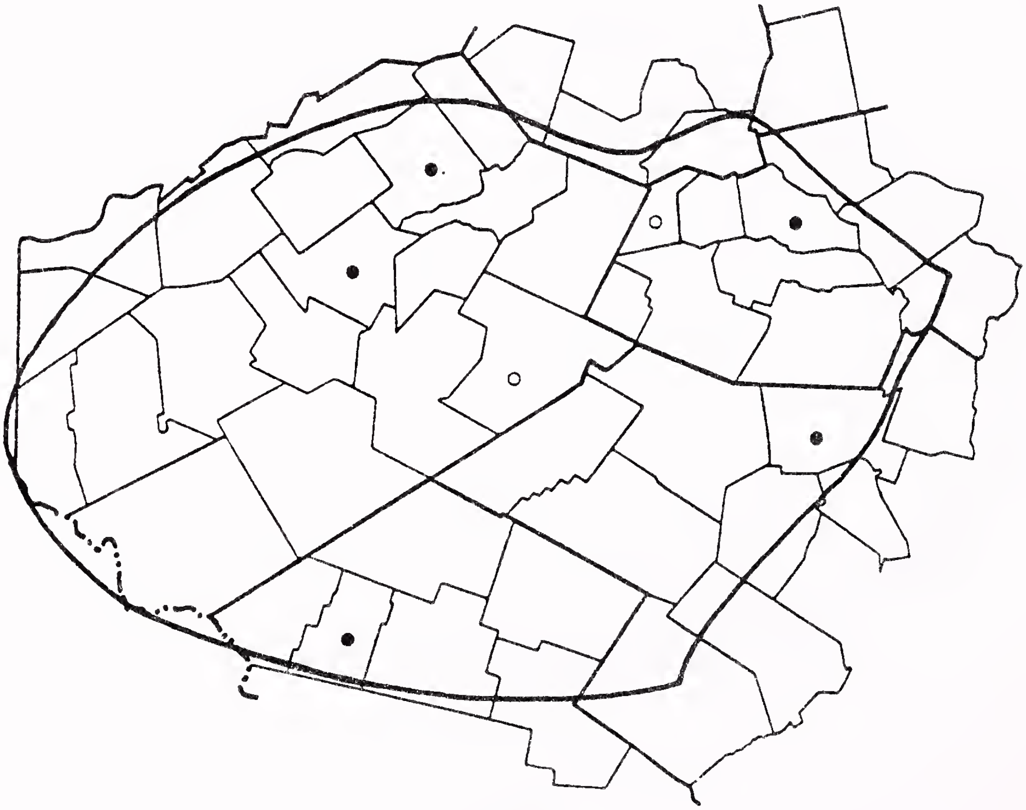
Brassica campestris L.
Bird's Rape



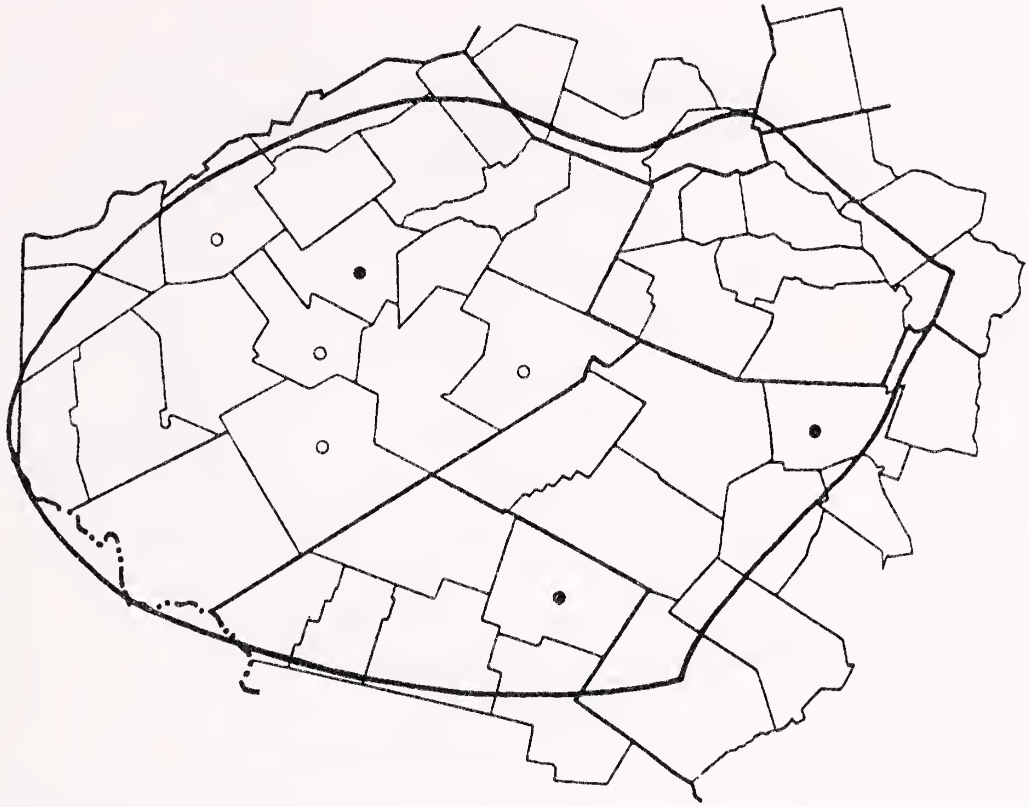
Brassica juncea (L.) Coss.
Chinese Mustard



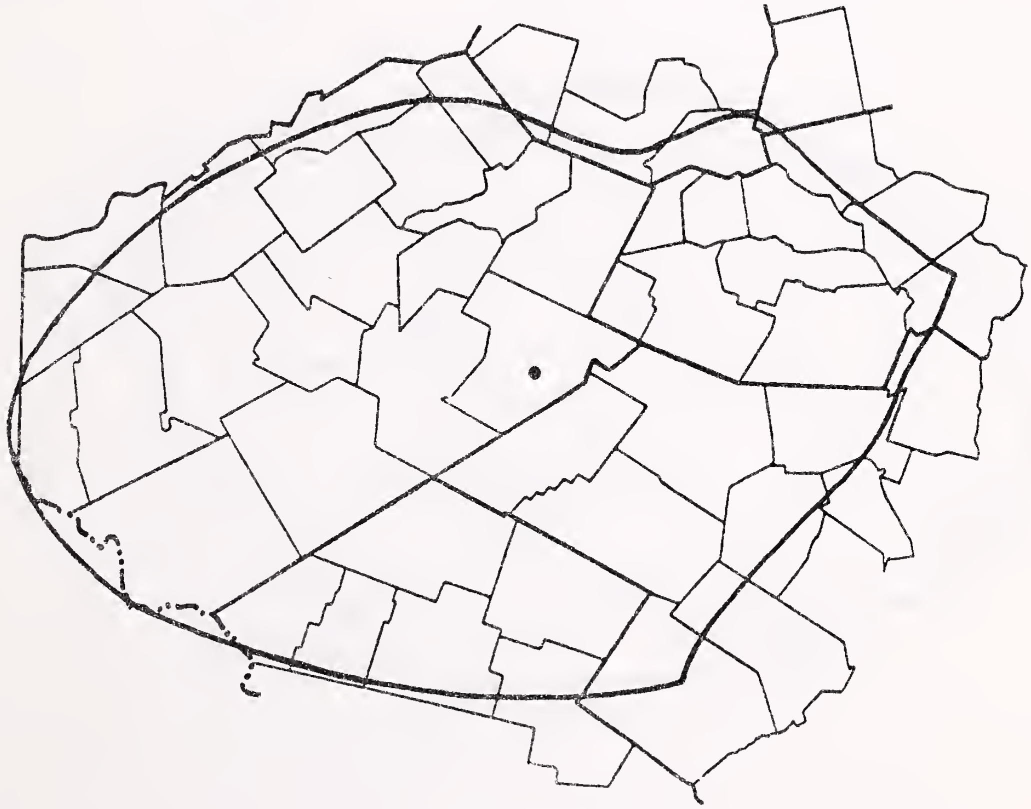
Brassica kaber (DC.) L. C. Wheeler
Charlock



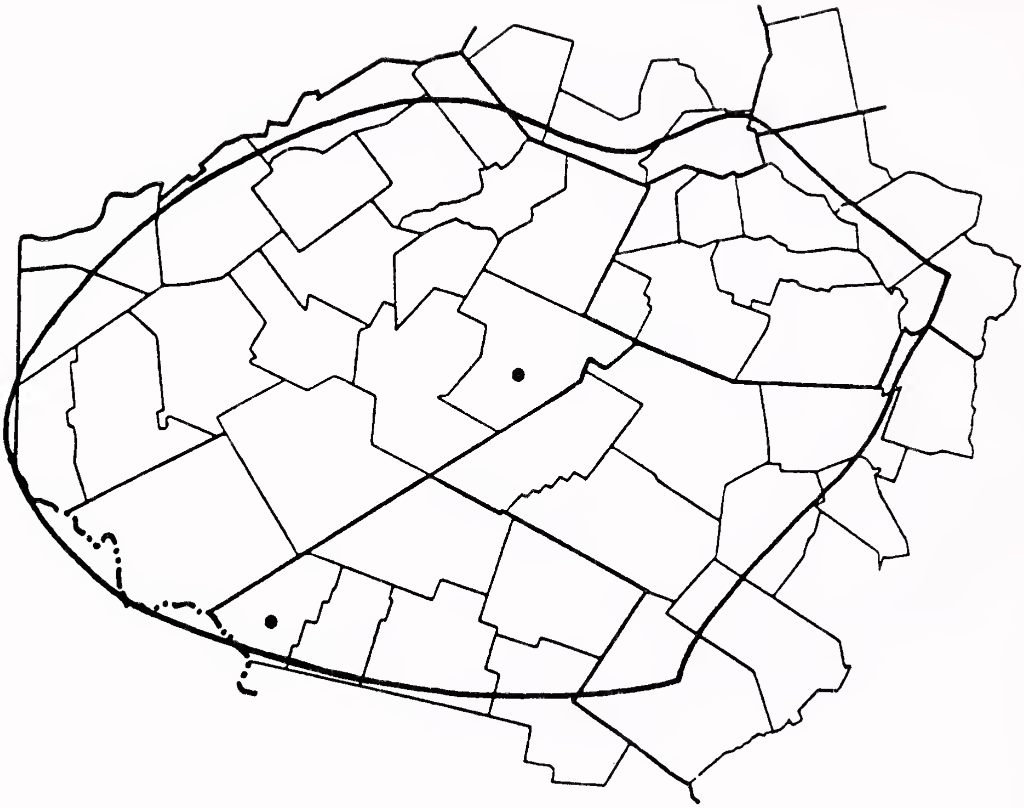
Brassica nigra (L.) Koch
Black Mustard



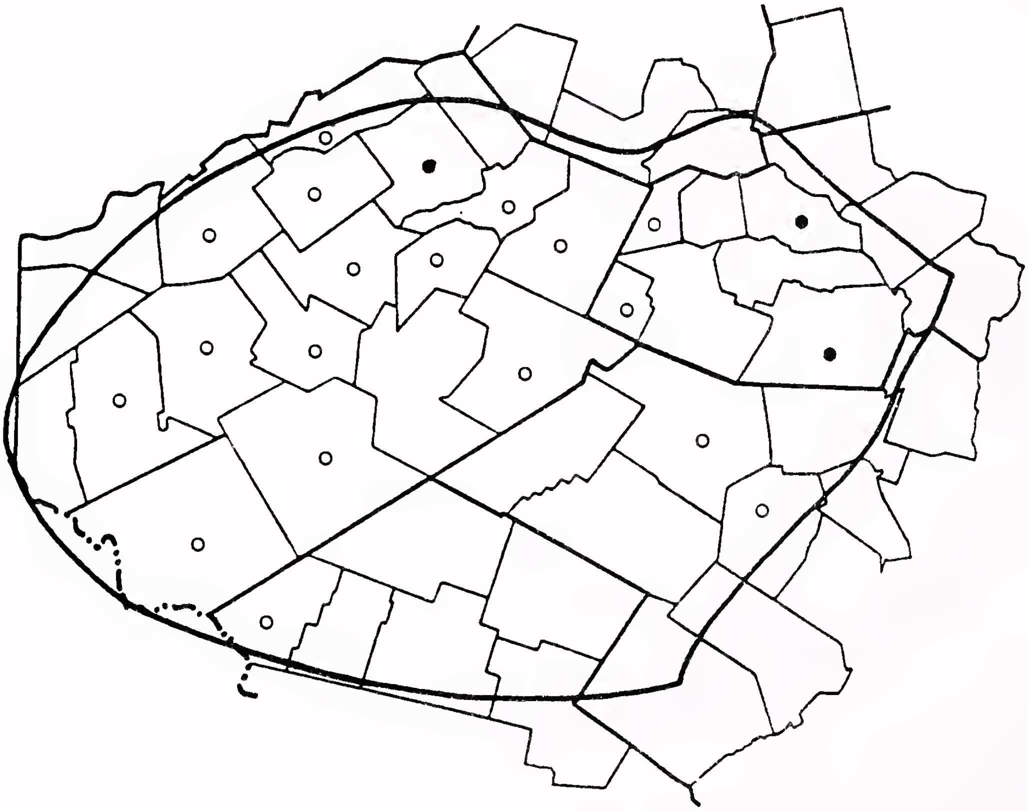
Brassica rapa L.
Turnip



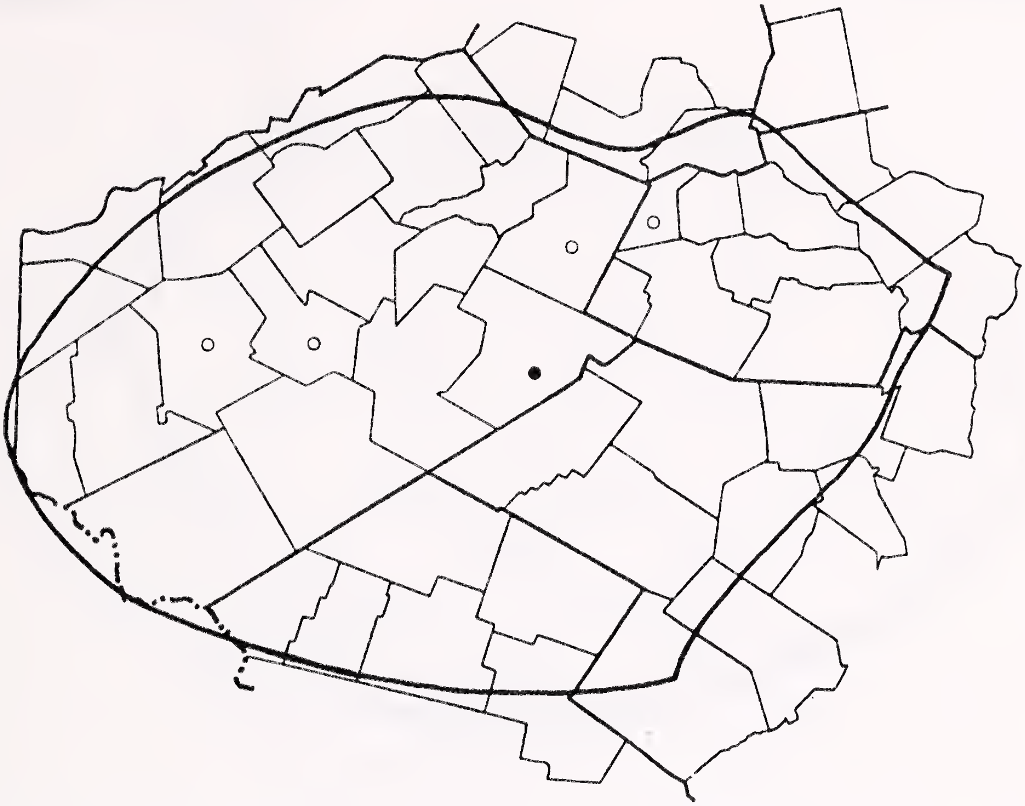
Camelina microcarpa Andrz.
Small-seeded False Flax



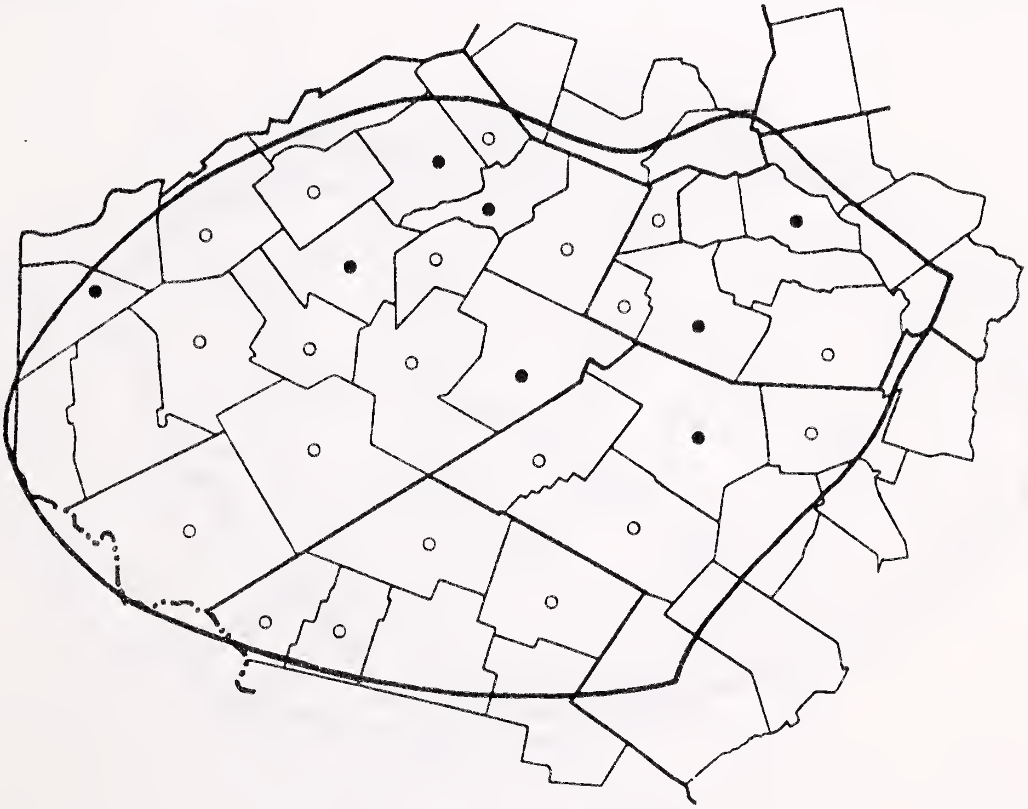
Capsella bursa-pastoris (L.) Medic.
Shepherd's-purse



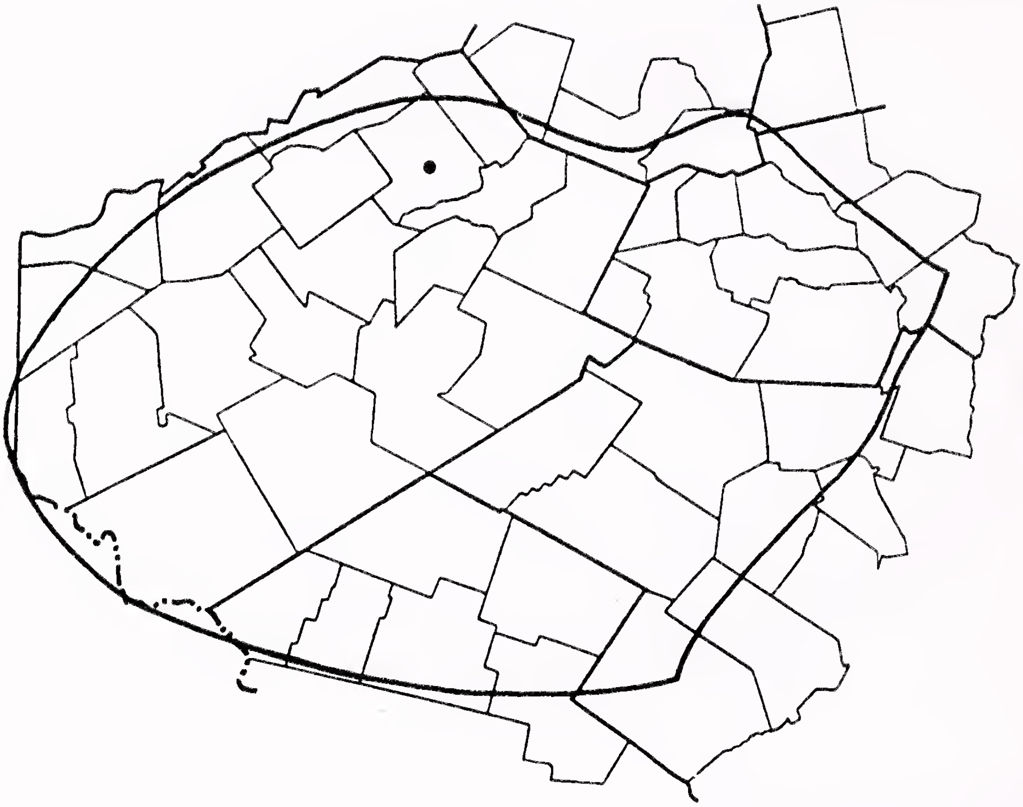
Cardamine concatenata (Michx.) O. Schwarz
Pepper-root



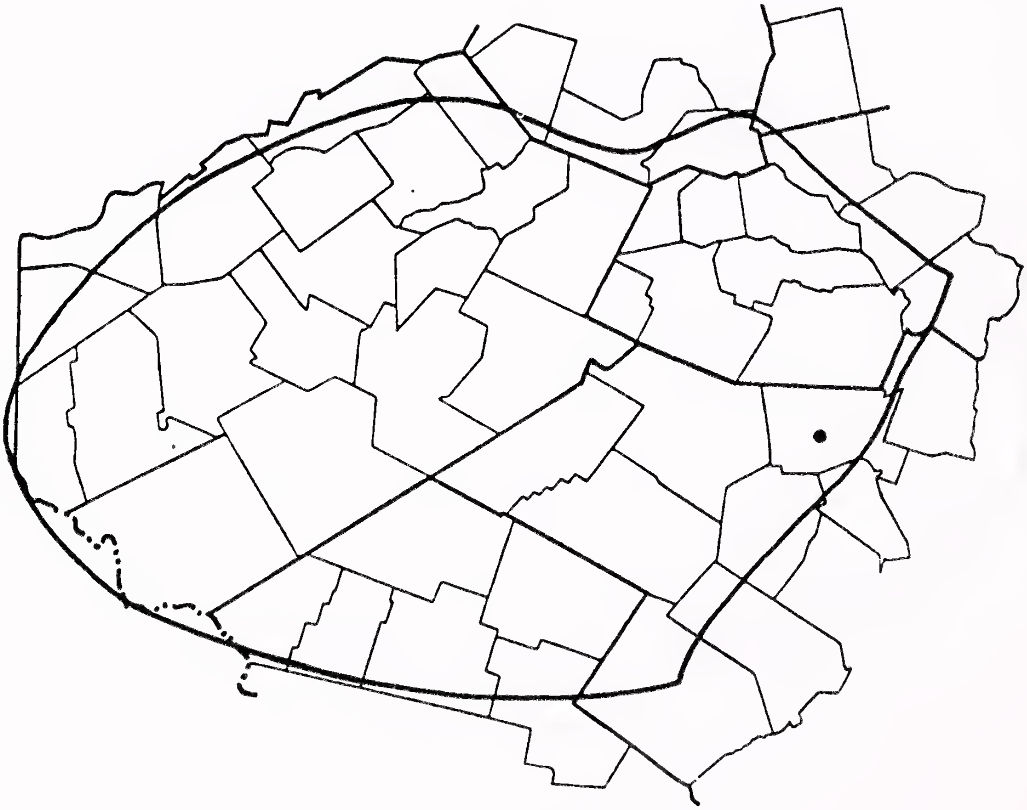
Cardamine diphylla Michx.
Crinkleroot



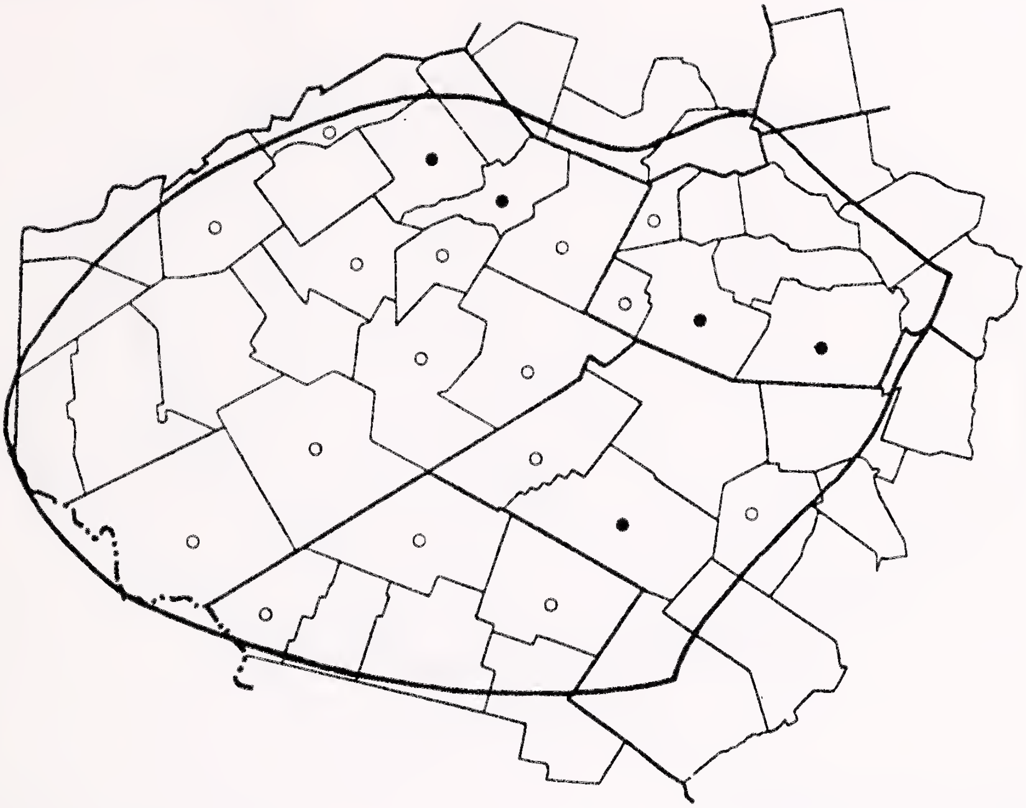
Cardamine douglasii (Torr.) Britt.
Purple Cress



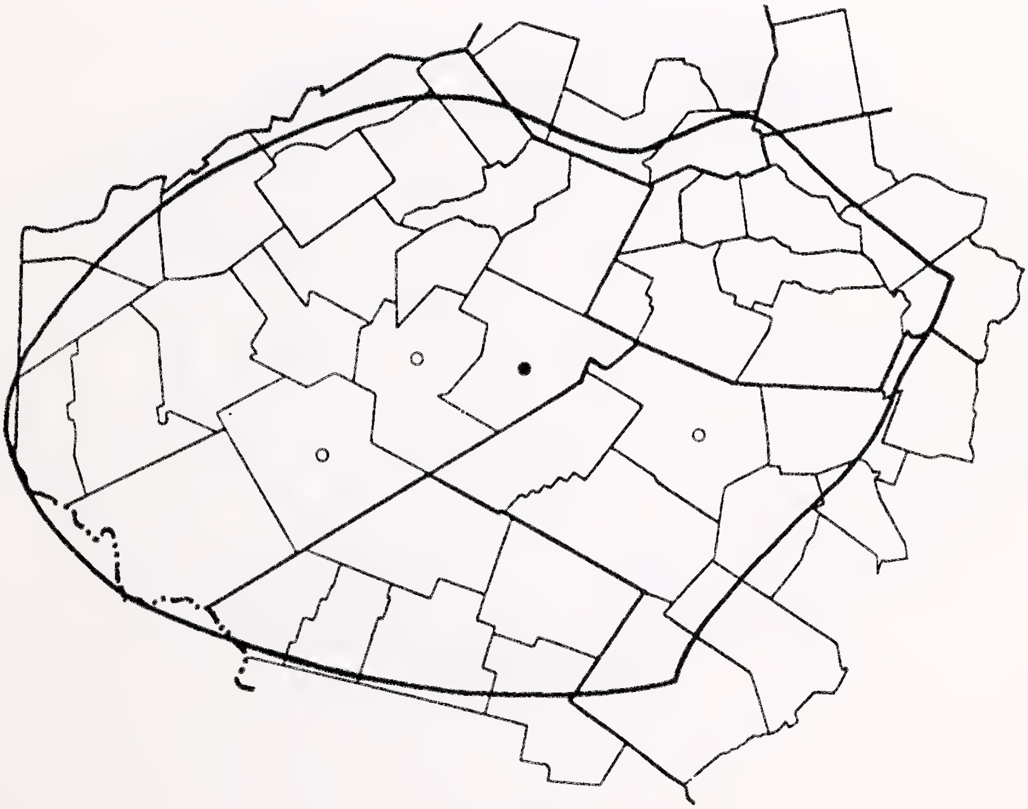
Cardamine parviflora L.
Small-flowered Cress



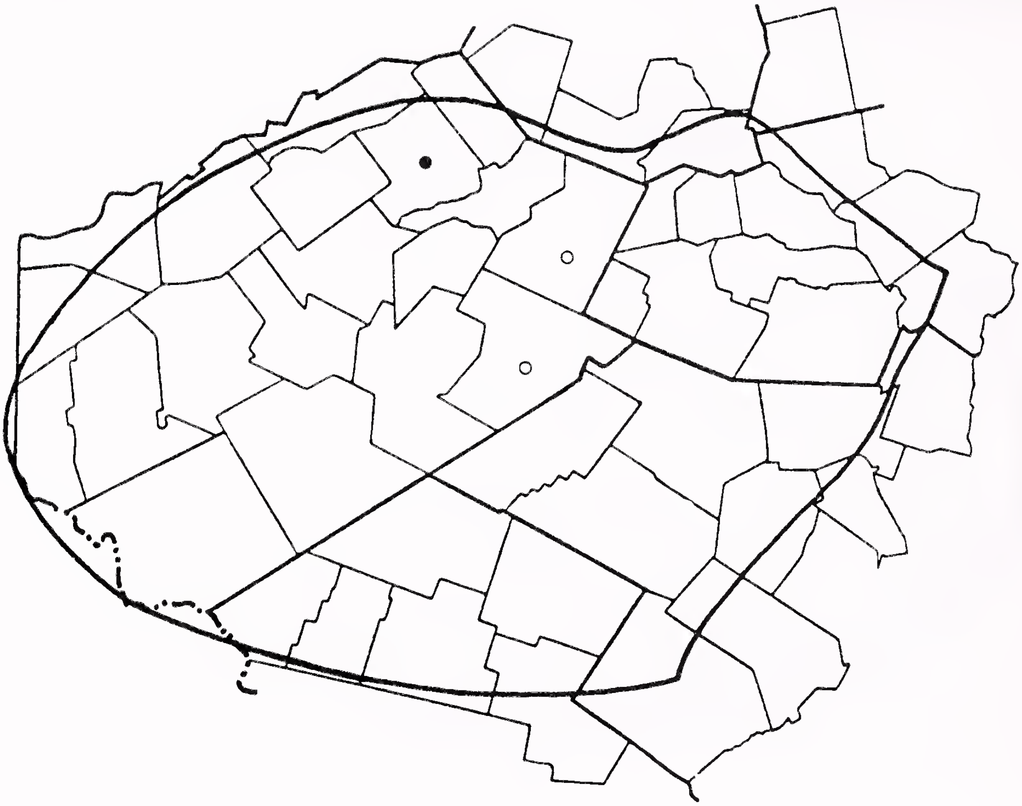
Cardamine pensylvanica Muhl.
Pennsylvania Cress



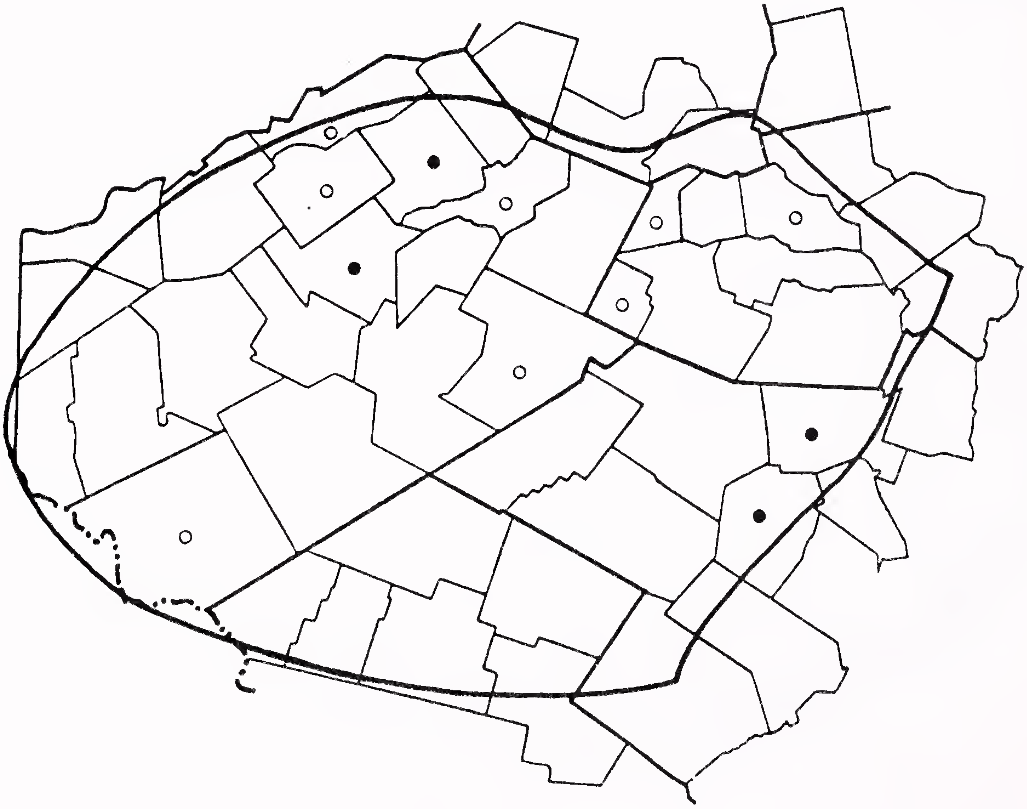
Cardamine pratensis L.
Cuckoo-flower



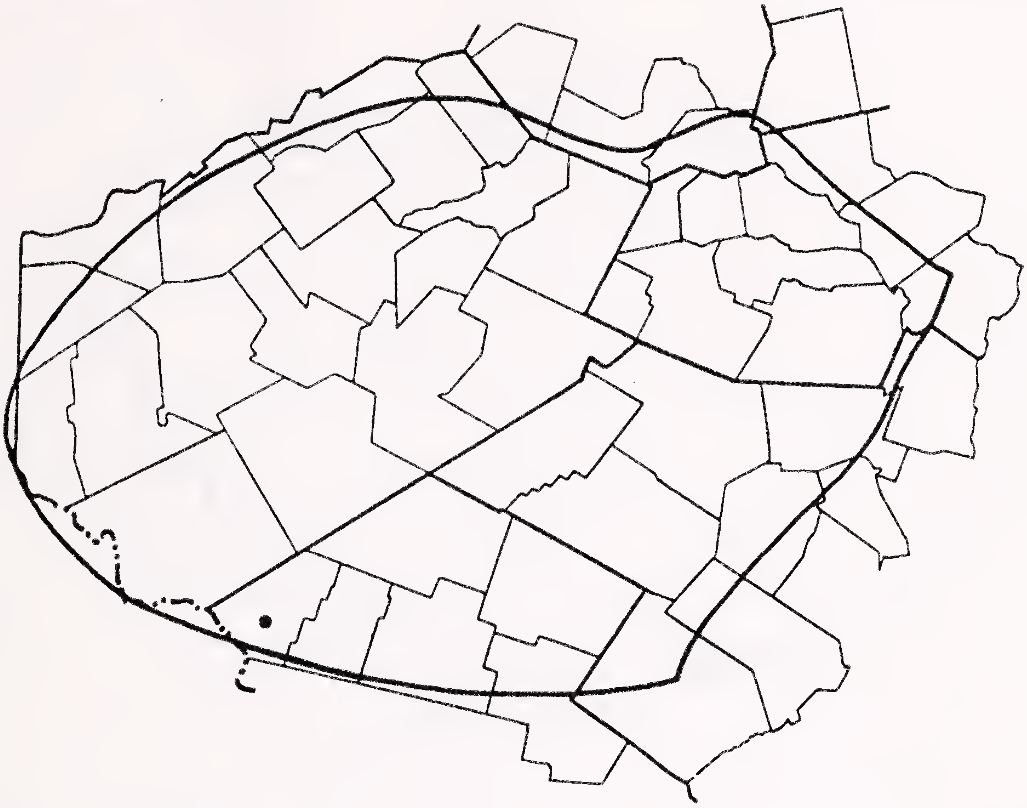
Descurania sophia (L.) Webb.
Tansy-mustard



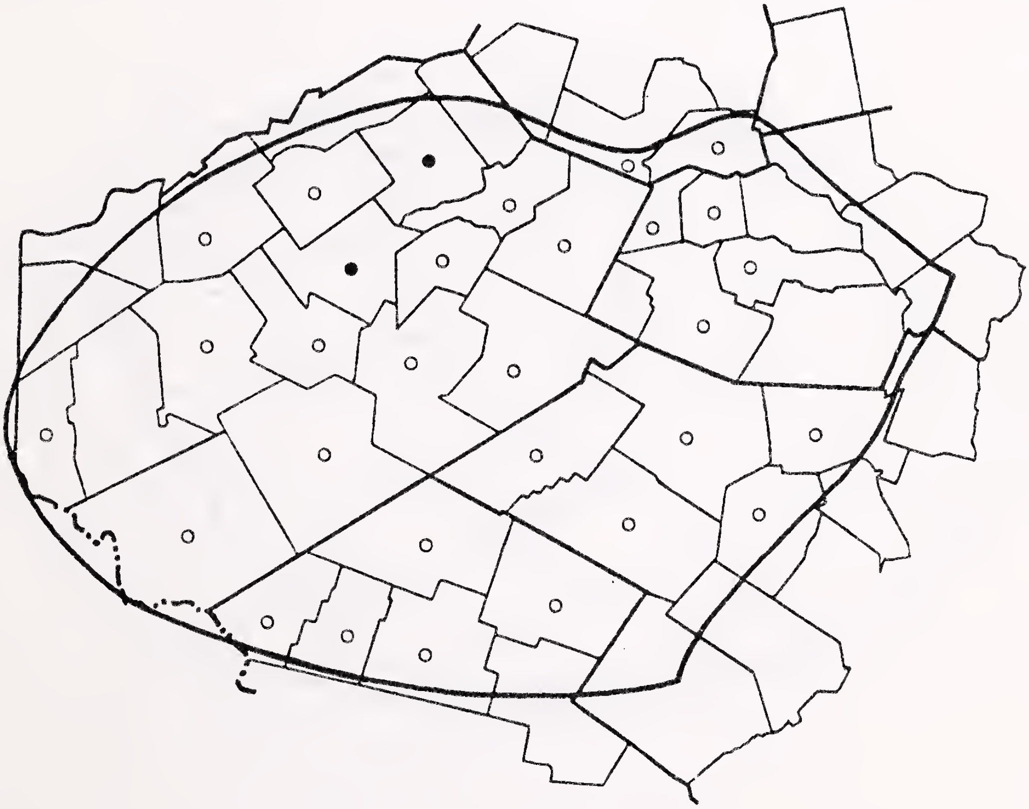
Erysimum cheiranthoides L.
Wormseed-mustard



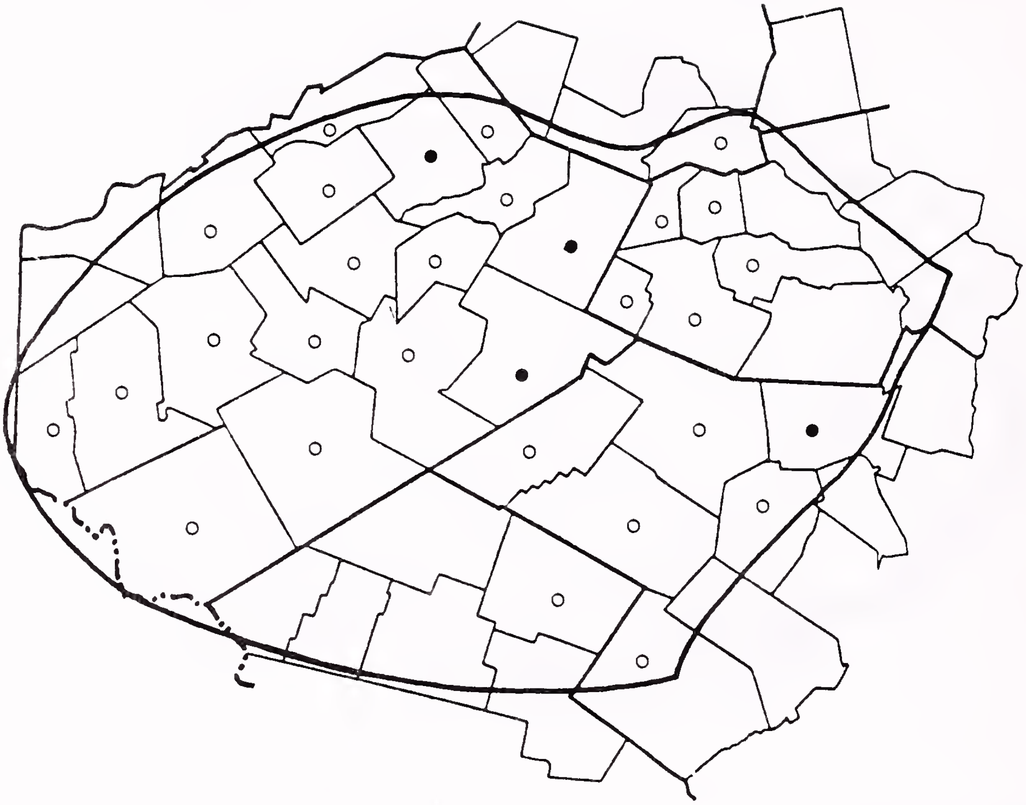
Erysimum repandum L.
Wavy-leaved Wormseed-mustard



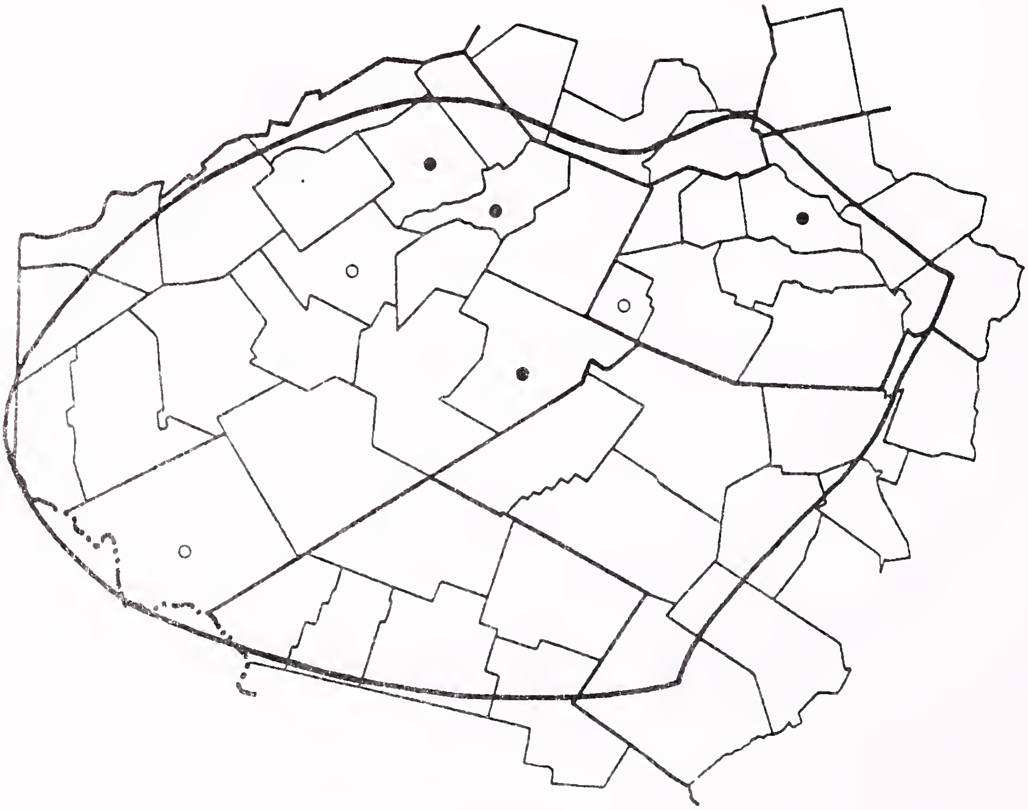
Hesperis matronalis L.
Dame's Rocket



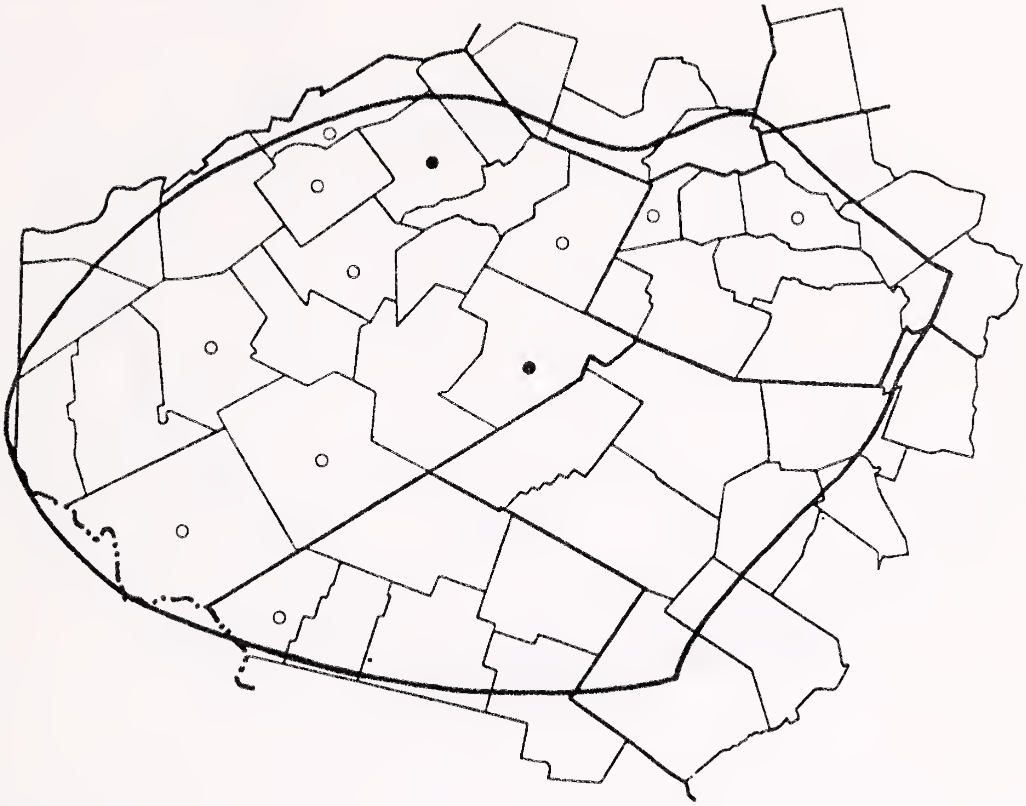
Lepidium campestre (L.) R. Br.
Cow-cress



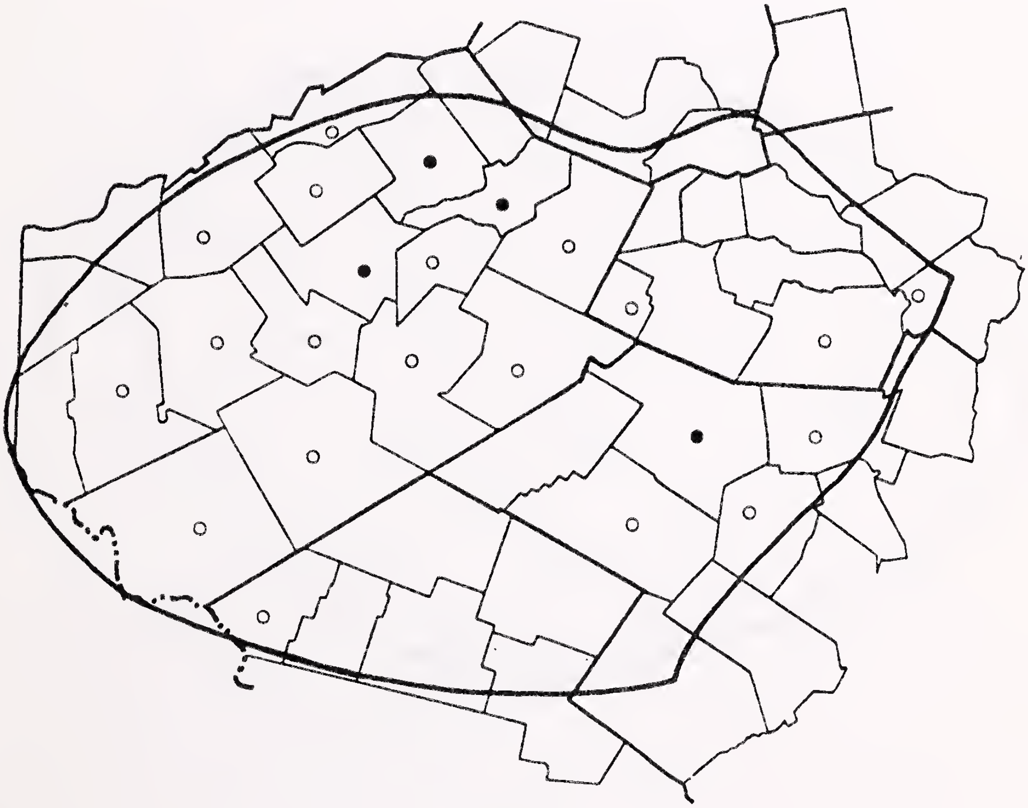
Lepidium densiflorum Schrad.
Peppergrass



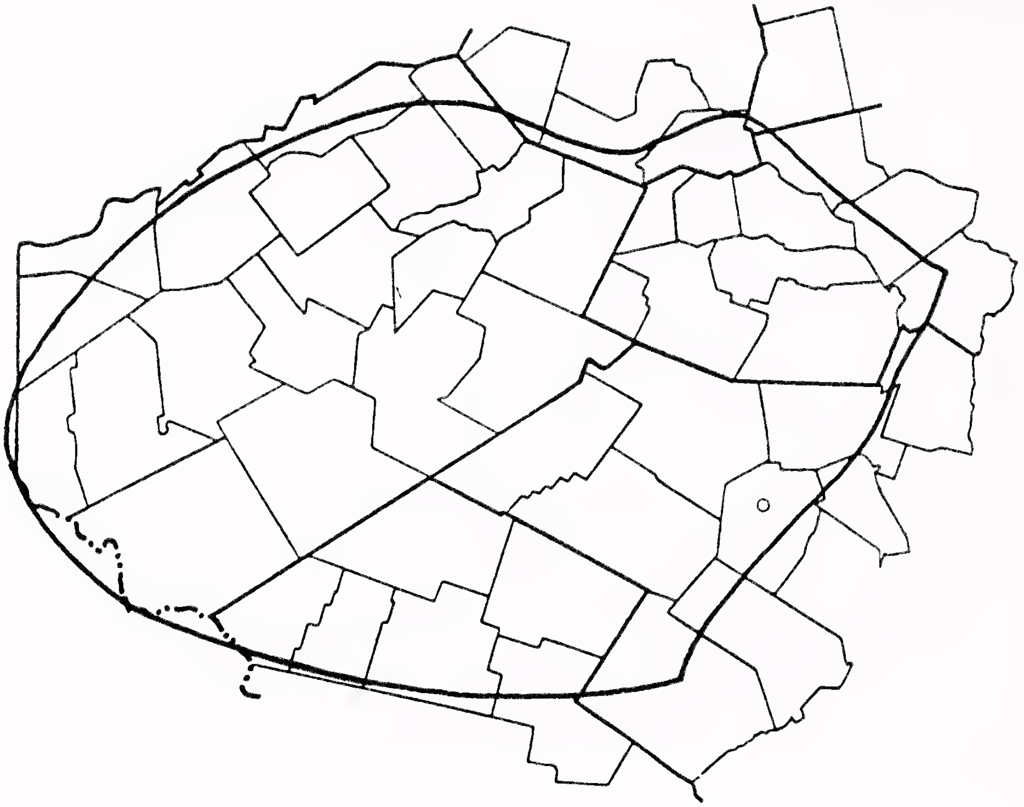
Lepidium ramosissimum Nels.
Bushy Peppergrass



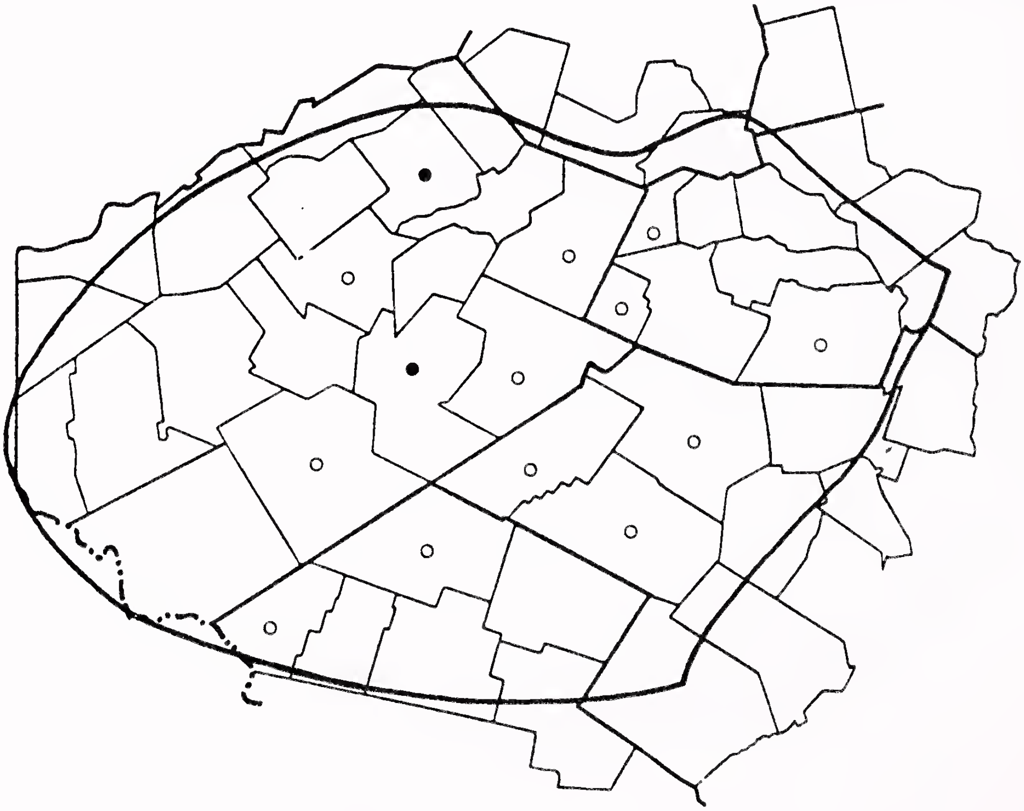
Lepidium virginicum L.
Poor-man's-pepper



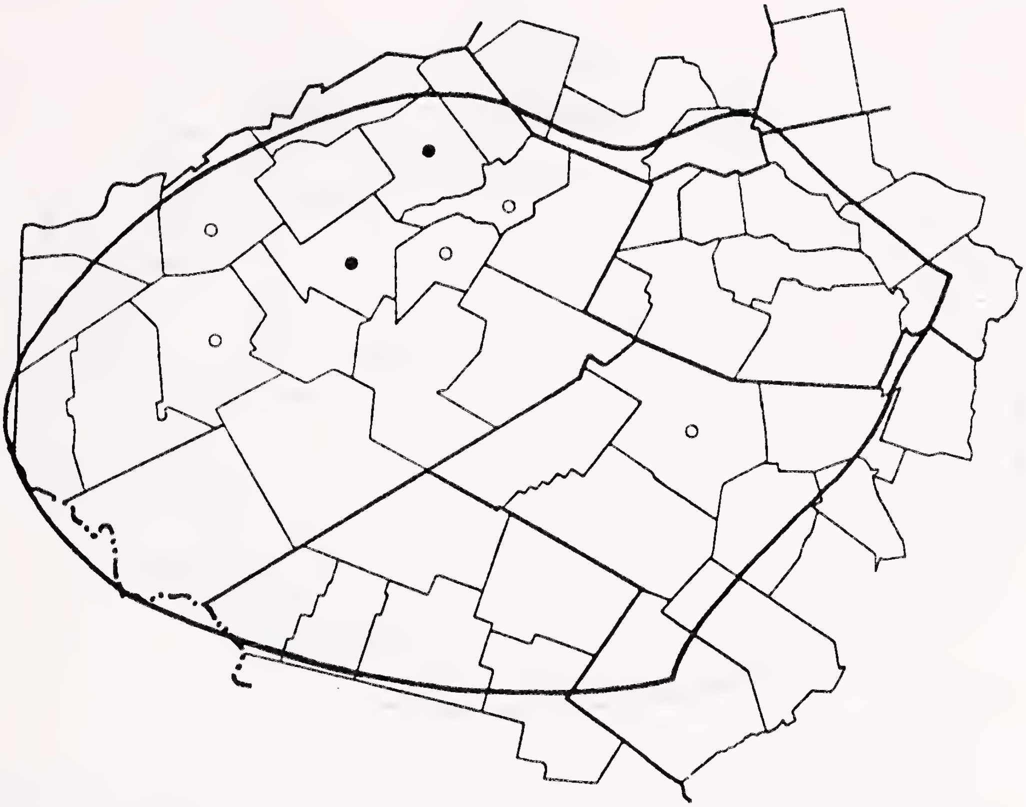
Lunaria annua L.
Moonwort



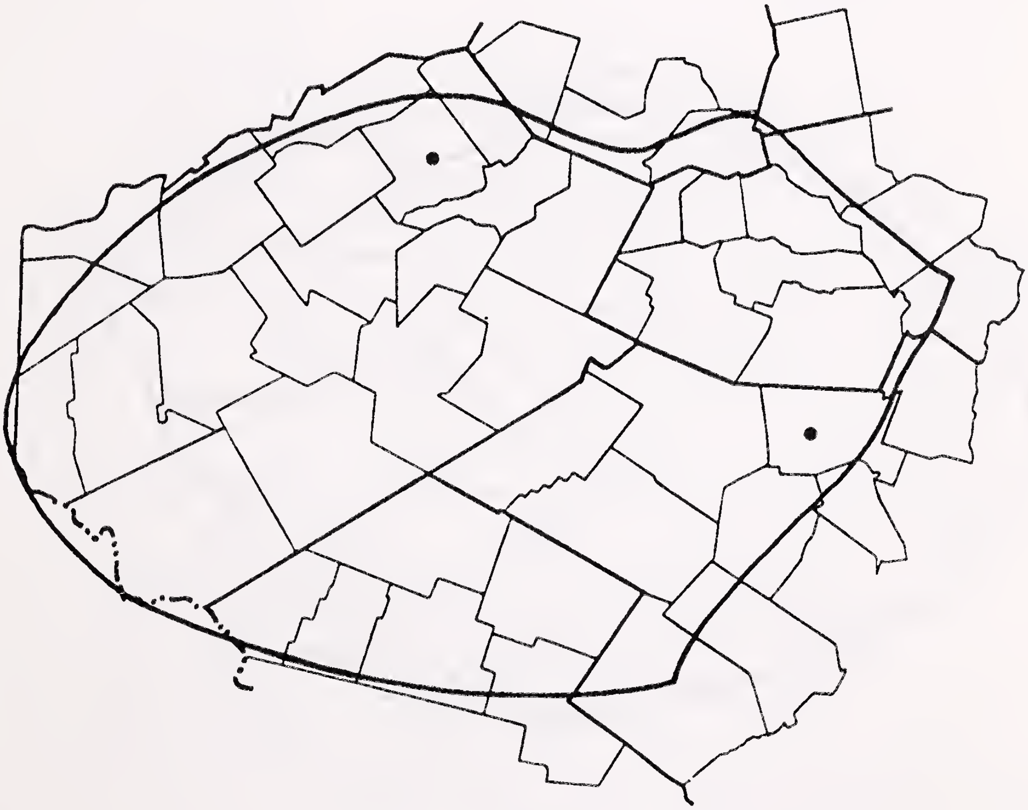
Nasturtium officinale R. Br.
Watercress



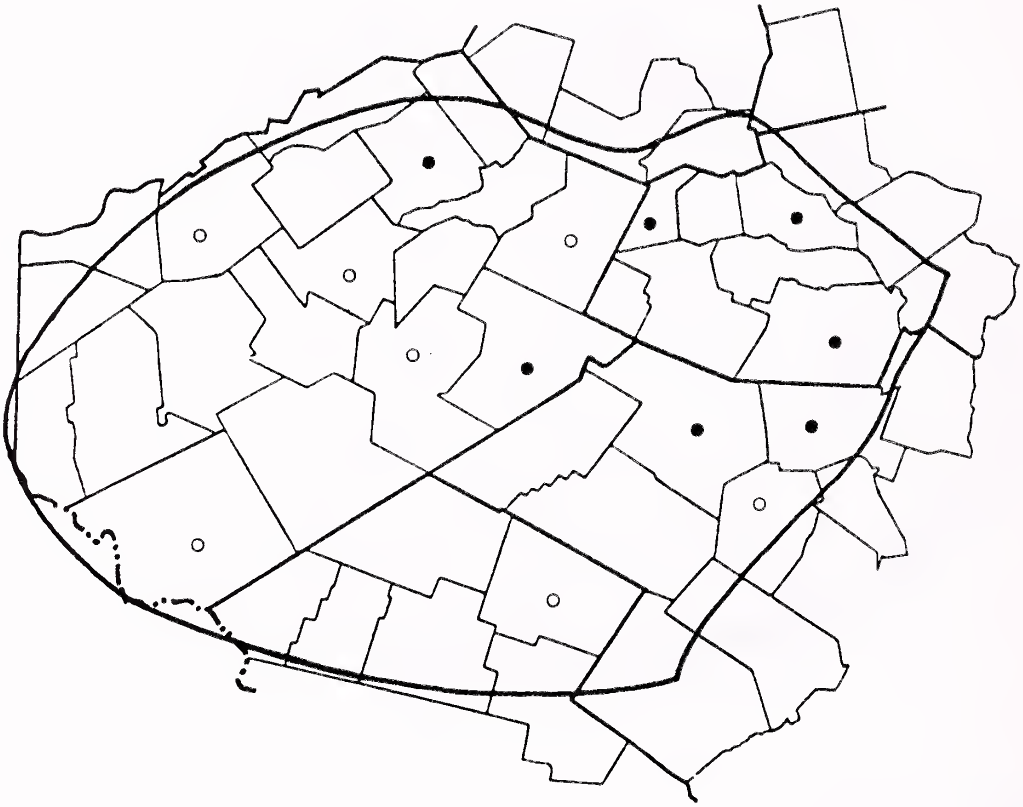
Raphanus raphanistrum L.
Wild Radish



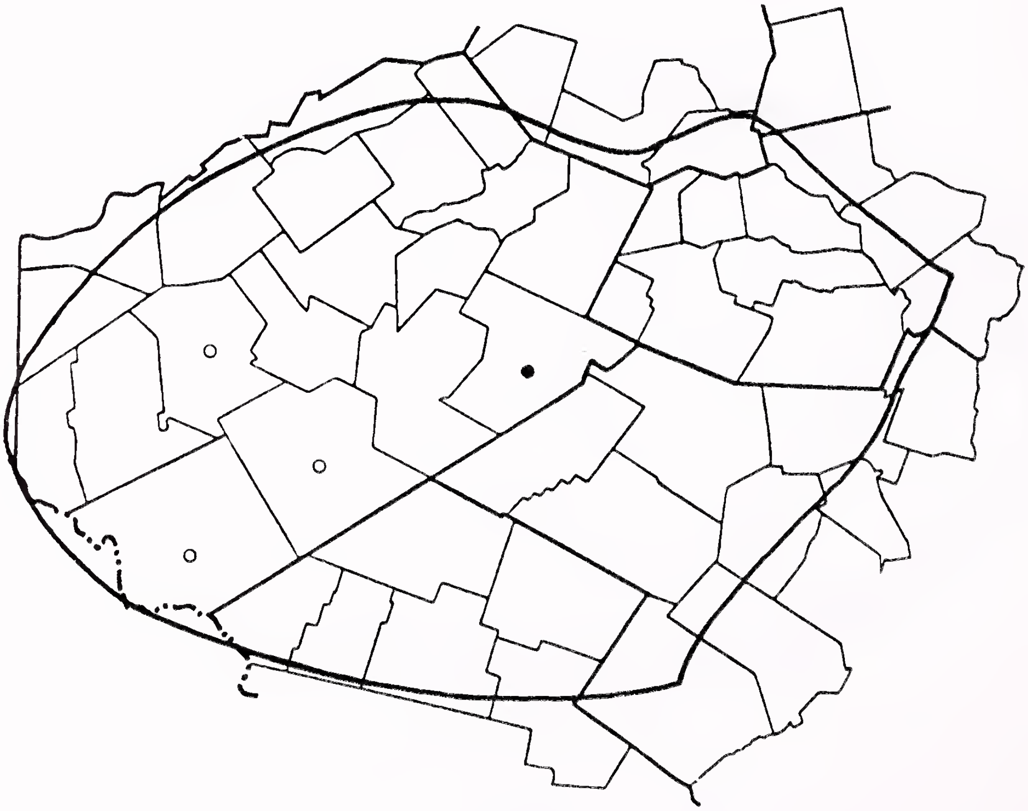
Raphanus sativus L.
Radish



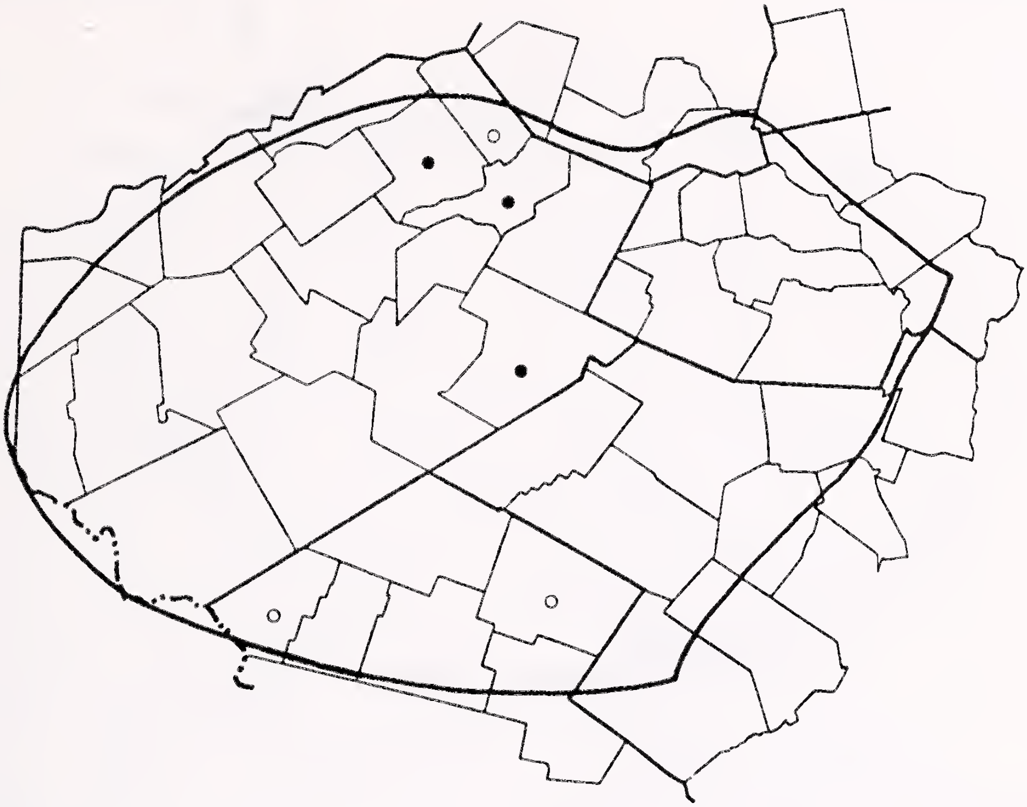
Rorippa palustris (L.) Bess.
ssp. fernaldiana (Butt. & Abbe.) Hult.
Marsh Cress



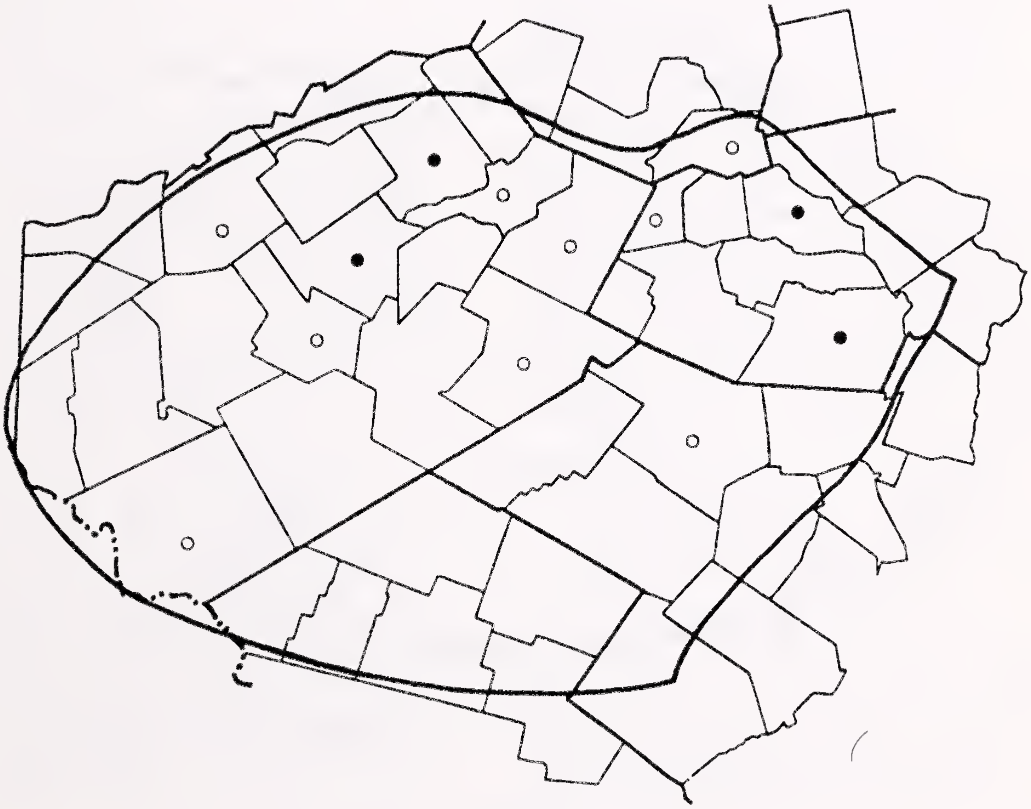
Rorippa sylvestris (L.) Bess.
Creeping Yellow Cress



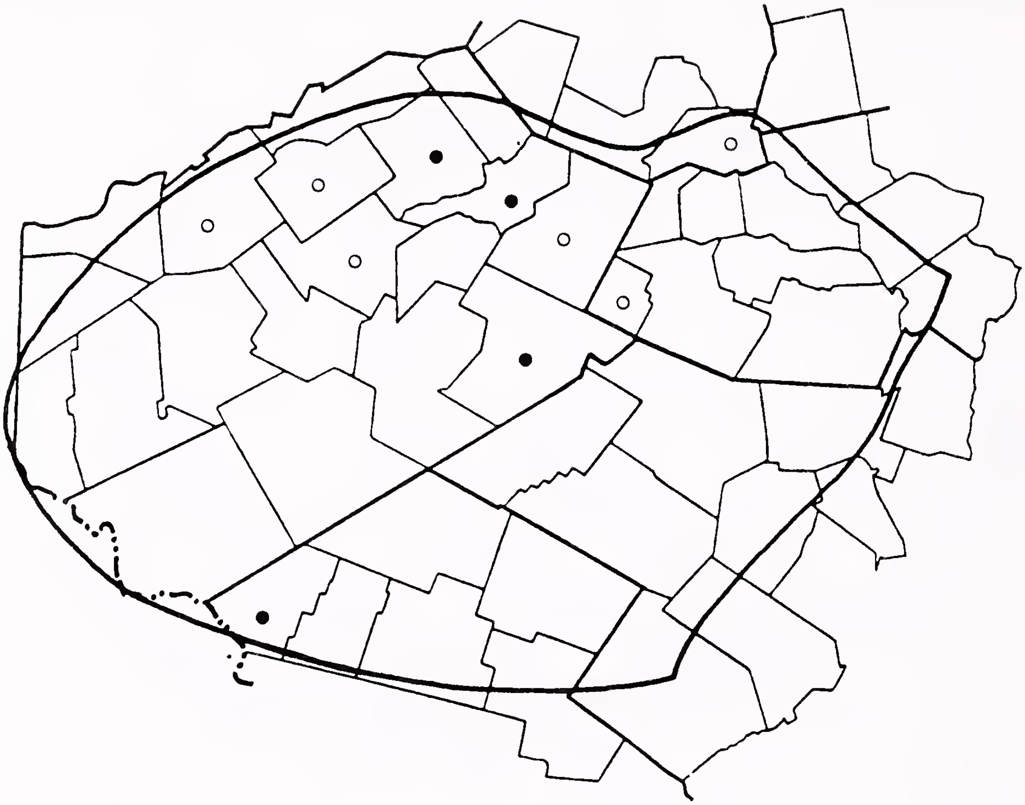
Sisymbrium altissimum L.
Tumble-mustard



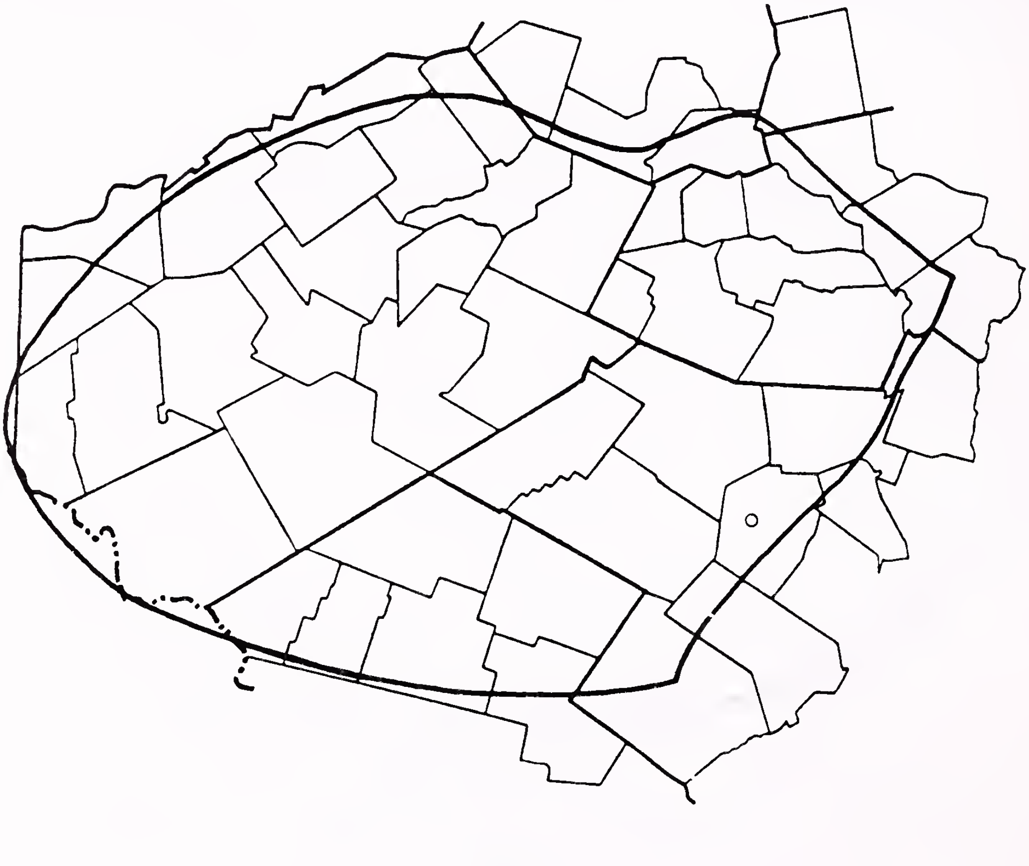
Sisymbrium officinale (L.) Scop.
var. leiocarpum DC.
Hedge-mustard



Thlaspi arvense L.
Penny-cress



Cleome spinosa Jacq.
Spider-flower



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